This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

832-20967

JANUARY, 1908.

ENTOMOLOGICAL NEWS

Vol. XIX. No. 1.

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON.
PHILIP LAURENT.
HENRY L. VIERECK.
WILLIAM J. FOX.
J. A. G. REHN.
H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September,** in charge of the Entom
logical Section of the Academy of Natural Sciences, Philadelphia,
and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.

Outside of the United States and Canada, $1.20.

SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal discou
on longer insertions. No advertisement taken for less than
60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NEW
Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

FOR SALE:—PSYCHE **Complete to end of Thirteenth Vol. (1906). fine set, bound in morocco, with the exceptio of last two volumes. Price $50 for the set.**

PHILIP LAURENT, 31 East Mt. Airy Avenue, Philadelphia, Pa.

A BUNCH OF RARE EXOTICS.

Teinopalpus imperialis, ♀	[illegible]	*Papilio Buddha*	
Amathusia [illegible]	[illegible]	" *maya*	
Kallima inachus	.40	*Morpho cypris*	
" *albofasciata*, ♂ .50, ♀	1.00	*Caligo eurilochus*	
Papilio Paris	.35	" *atreus*	
" *philoxenus*, ♂	.50	*Attacus atlas* (Celebes Islands)	
" [illegible]	[illegible]	*Actias isis* "	
" [illegible]	[illegible]	*Urania* [illegible]	

All specimens are in papers, and in perfect condition. Postage paid on orde
of one dollar and over. Send six cents for postage
on order for less than one dollar.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA

ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in botan
especially cacti and herpetology—reptiles and amphibians if notified early
the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th St
New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSECTS

(EXCEPT ODONATA)

OF THE UNITED STATES

BY NATHAN BANKS

Complete to Summer of 1907 Price 50 cts. (net) per copy Mailed on receipt of pri

E. T. CRESSON, Treasurer,
P. O. Box 248, Philadelphia, Pa

Entomological News

AND

PROCEEDINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

Academy of Natural Sciences of Philadelphia.

VOLUME XIX, 1908.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON
PHILIP LAURENT
HENRY L. VIERECK
WILLIAM J. FOX
J. A. G. REHN.
H. W. WENZEL.

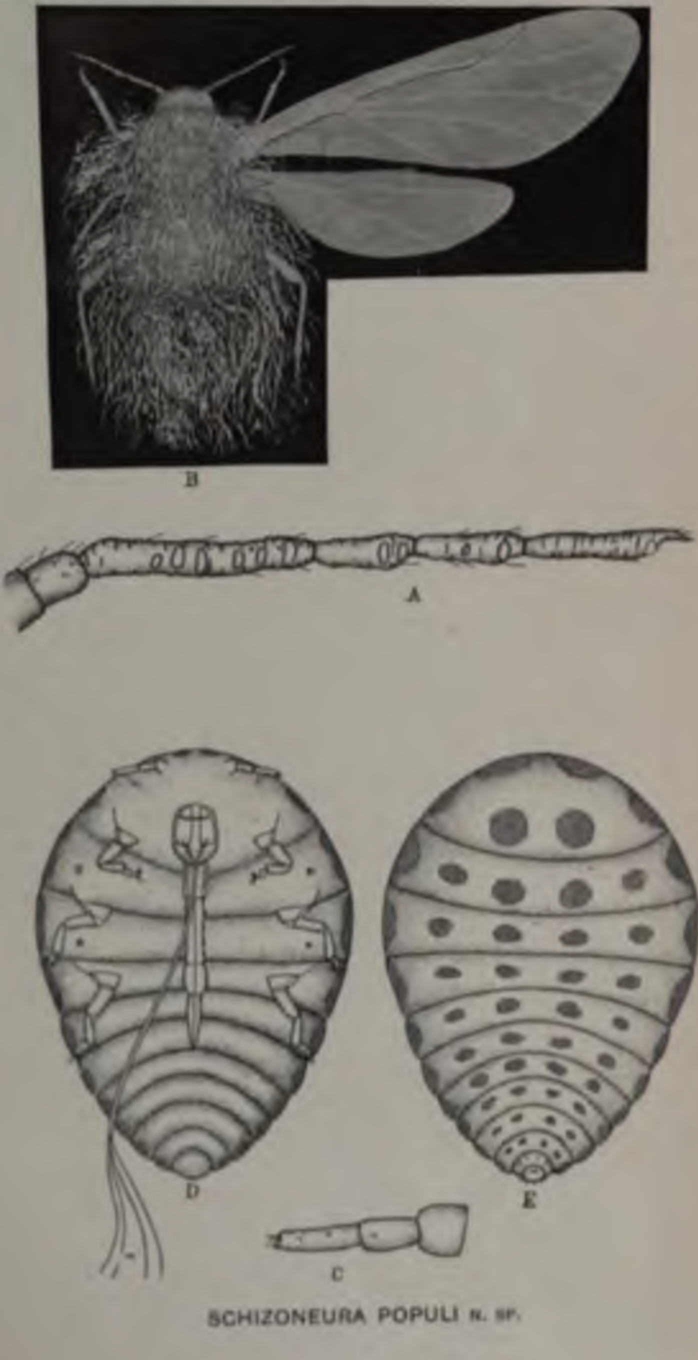
PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

1908.

41 90 5045T 53 005 XL P.Bd 1196

P. O. STOCKHAUSEN
PRINTER
53-55 N. 7TH ST., PHILA., PA.

122595



SCHIZONEURA POPULI n. sp.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. JANUARY, 1908. No. 1.

CONTENTS:

Gillette—The poplar bark aphid (Schizoneura populi n. sp.) 1
Girault—Standards of the number of eggs laid by insects—VI 4
Doane—Notes on the Tipulid genus Dicranomyia 5
Merrick—The Inflation of Larvae 9
Melander—Annihilating the Coddling Moth 11
Williams—A new Eriocrania (Lepidoptera) from the Pacific Coast 14
Brimley—Notes on the Orthoptera of Raleigh, North Carolina 16
Smith—Notes on the larval habits of Culex perturbans 22
Wellman—Notes on some Angolan insects of Economic or Pathologic Importance 26
Editorial 34
Entomological Literature 35
Notes and News 41
Doings of Societies 46

The Poplar Bark Aphid (Schizoneura populi n. sp.)

C. P. GILLETTE.

(Plate I)

I have noticed a pale yellow schizoneuran infesting the crevices in the bark of trunks and limbs of the native narrow-leaved cottonwood, the broad-leaved poplar, the Carolina poplar, and the balm of Gilead, for several years upon the Western Slope, in Colorado. I have noted the louse as specially numerous at Grand Junction, Delta, Paonia and Montrose.

The white cottony secretion often fills nearly all of the crevices in the bark and it remains throughout the year, hiding the lice and their eggs.

On June 14th, of last year, Mr. E. P. Taylor told me of finding one of the winged lice, and two days later I collected a good number lodged upon Mr. Taylor's porch screen, there being some badly infested balm of Gilead trees in front of the house. At this time eggs and young were very numerous Mr. Taylor noted the appearance of winged lice for about two weeks, when they disappeared for the remainder of the summer. As fast as winged lice appeared they left the trees, but I have not been able to get any clue as to where they go.

I attempted to get them to locate upon cottonwood twigs by inclosing them with twigs in a breeding cage, but without success.

While it seems probable that the winged migrants establish new colonies somewhere, perhaps upon some different food plant, it is also certain, as in the case of *Chermes coloradensis*, that some of the apterous females live over winter upon the trees, for bark which I removed January 20th, at Grand Junction, was found to have living lice and some eggs. These eggs I was able to hatch in the laboratory, and the young established themselves upon cottonwood twigs that were furnished them and did well. When very numerous, the lice often cause rough, knot like growths of trunk or branches, much as in the case of *Schizoneura lanigera* of the apple.

The Eggs.—The eggs are very pale straw yellow, much lighter than any of the *Chermes* eggs I have seen, and are .023 mm. in length by .014 mm. in width. The eggs are not attached but simply entangled by the cottony secretion.

Young. The newly hatched young are like the eggs in general color, with legs, antennæ and distal end of the long beak dusky, and the eyes bright red.

Adult Apterous Female.—The adult apterous females are also very light yellow in color, the older individuals being the darker. Large females measure approximately .8 mm. long by .6 mm. broad. The size and arrangement of the wax glands or plates are best indicated in the drawing, Plate I, Figs. D and E. The only plates showing on the ventral surface are the marginal ones, while dorsally all the longitudinal rows extend continuously to the eighth abdominal segment. At least they can be so traced in some individuals. The beak is peculiar, in that it may be extended so as to attain, or even surpass, the tip of the abdomen, when it appears to be four jointed. The rather long basal piece seems to serve as a tube into which the next joint, the real first joint, composed of seven or eight serial pieces, as shown in the figure, may be telescoped. The two distal joints are both quite short. From specimens taken June [illegible] and December 12th, [illegible], at Grand Junction.

Winged Female.—Length of fore-wing, 3.50 to 3.75 mm.;

hind-wing, 2.35 to 2.75 mm. Length of body, 1½ to 2 mm. Antennæ, 6-jointed, length, .8 mm. Joints 1 and 2, short and stout, the 2nd a little longer than broad; 3rd, longest, equaling 4th and 5th together; 5th, a trifle longer than 4th; and 6th, distinctly longer than 5th. The proportions of the 4 distal joints are about as follows: 21, 9, 11, 15. Total length of antenna a little less than one-half length of body. Compound eyes, ocelli, abdomen, tips of tarsi and antennæ, and more or less of the thorax above, dusky to black, otherwise pale yellow. The anterior wing has a very distinct, though narrow, black line extending from the base along the subcostal nerve, but a little beneath it and terminating on the costal margin just beyond the stigma. A similar black line starts on the anal margin of the hind-wing close to the body and extends forward and outward to meet the costal nerve and then turns at an acute angle back to the costal margin close to the body. Body and wings are powdered with a white secretion and from thorax and abdomen a white waxy secretion forms in long, slender threads, nearly or quite hiding the body. Antennal spur of 6th joint not over 1-5 length of joint and with a large sensorium at its base, also large oval sensoria near distal ends of joints 4 and 5, and along the underside of joint 3, where there are about 6.

Described from specimens taken at Grand Junction, Colorado, June 16th, 1907.

DESCRIPTION OF PLATE I.

Plate I, *Schizoneura populi.*—A, antenna of alate female × 100; B, winged female × 70; C, antenna of apterous female × 280; D and E, ventral and dorsal views of adult apterous female, showing arrangement of wax plates or glands × 70.

Miriam A. Palmer, artist.

* * *

EDITOR ENTOMOLOGICAL NEWS:—If Mr. W. E. Longley will look over the collection which I sold Field Columbian Museum, I think he will find a specimen of *Sesia titan* with label showing that it was taken at North Evanston, Ill., a little farther north than Oak Park. At least two examples of that species were taken there, but both worn, showing that they had probably traveled from a warmer climate.—ARTHUR J. SNYDER, Springfield, Idaho.

Standards of the Number of Eggs Laid by Insects—VI.*

Being averages obtained by actual count of the combined eggs from twenty (20) depositions or masses.

BY A. ARSENE GIRAULT.

7. CULEX RESTUANS THEOBALD.

No.	Date, 1907	No. counted per mass	Successive totals	Av. per egg mass	Max.	Min.	Range	
1	July 12	244	244	244.			391	
2	—	298	542	271.				
3		157	699	233.		157		
4		278	977	288.5				
5	July 20	391	1368	273.6	391			
6		371	1739	289.8				
7		265	2004	286.2				
8		261	2265	283.1				
9	July 29	283	2548	283.1				
10		240	2788	278.8				
11		231	3019	274.4				
12		256	3275	272.9				
13		269	3544	272.6				
14	July 30	258	3802	271.5				
15		229	4031	268.7				
16		242	4273	267.				
17		279	4552	265.8				
18	July 31	258	4810	267.2				
19		245	5055	266.				
20		287	5342	267.1			159	
20			5342	267.1	391	157	234	Finals

The egg-masses were obtained at New Richmond, Ohio, during July, 1907, by exposing a large tub of water out of doors. Within a week afterwards, the water in the tub was literally alive with the young of *restuans*, and numerous egg-masses were found each morning floating on its surface. The great majority of the adults reared were captured and carefully examined, but during the month no other species made its appearance.

I am indebted to Mr. Frederick Knab, U. S. National Museum, for determination of the species.

---

* For the first five of these series see Ent. News, [illegible]

Notes on the Tipulid Genus Dicranomyia.

R. W. Doane, Stanford University.

TABLE FOR THE DETERMINATION OF THE SPECIES.*

(Based on Osten Sacken's table in Mon. N. A. Dip. Pt. 4.)

1. Wings remarkably narrow, lanceolate . . . . . . **longipennis** Schum.
Wings of the usual shape . . . . 2.
2. Tip of the auxiliary vein nearly opposite, or before, or only a short distance beyond the origin of the praefurca . . . . 3.
Tip of the auxiliary vein a considerable distance beyond the origin of the praefurca . . . . 31.
3. The whole antennae, or at least their basal joints pale . . . . . . 4.
The whole antennae black or brown . . . . 13.
4. Discal cell open . . . . 5.
Discal cell closed . . . . 7.
5. Thorax with a single brown stripe in the middle . . **immodesta** O. S.
Thorax with three brown stripes . . . . 6.
6. Tip of the auxiliary vein nearly opposite or only a little before the origin of the praefurca . . . . **gladiator** O. S.
Tip of the auxiliary vein a considerable distance before the origin of the praefurca . . . . **cinerea** Doane.
7. Flagellum of the antennae not infuscated . . . . . . **pudica** O. S.
Flagellum of the antennae more or less infuscated . . . . 8.
8. Knob of the halteres infuscated . . . . 9.
Knob of the halteres not infuscated . . . . 11.
9. Subcostal cross-vein close to the tip of the auxiliary vein. **citrina** Doane.
Subcostal cross-vein some distance from the tip of the auxiliary cross-vein . . . . 10.
10. Halteres pale, knobs infuscated ; abdomen brownish yellow. **isabellina** Doane.
Halteres and abdomen infuscated . . . . **diversa** O. S.
11. Brownish markings along some of the veins and in some of the cells. **marmorata** O. S.
Wings hyaline . . . . 12.
12. Body yellowish . . . . **fulva** Doane.
Body greenish . . . . **viridicans** n. sp.
13. Discal cell (in normal specimens) open ; tip of the auxiliary vein considerably anterior to the origin of the praefurca ; the praefurca is about equal in length to the distance between the origin of the third vein and the small cross vein, or even shorter . . 14.
Discal cell closed ; tip of the auxiliary vein nearly opposite the origin of the praefurca (or, when anterior or posterior, the distance is small) ; praefurca distinctly longer than the distance between the origin of the third vein and the small cross vein . . . 18.

---

* I have not seen *D. chorea* Meig., and cannot from the description place it or *D. venusta* Berg. in the table. The latter is closely related to *D. simulans* Walk and *D. duplicata* Doane.

14. Rostrum and proboscis nearly as long as the head . **rostrifera** O. S.

Rostrum and proboscis much shorter than the head 15

15. Thorax brown . . . . **floridana** O. S.

Thorax ochraceous . . . . 16.

16. Thorax with a single broad brown stripe . . . . . **ochracea** Doane.

Thorax with three brown stripes 17

17. Stigma pale . . . . **brevivena** O. S.

Stigma fuscous . . . . **vulgata** Berg.

18. Thorax shining black, pleura with a silvery reflection. **morioides** O. S.

Thorax brownish or grayish . . . . 19.

19. Femora with a narrow pale band at the tip . . . . 20.

Femora without such a band . . . . 21.

20. Posterior margins of the segments of the abdomen lighter. **badia** Walk.

Posterior margins of the segments of the abdomen not lighter. **adjecta** n. sp.

21. The distance between the tip of the auxiliary vein and the subcostal cross-vein is nearly or quite as long as the stigma . . . . . 22.

The distance between the tip of the auxiliary vein and the subcostal cross-vein is shorter than one half the length of the stigma . 27.

22. Halteres unusually long . . . . 23.

Halteres of usual length . . . . 24.

23. Thorax brown, stripes confluent . . . . **halterata** O. S.

Thorax yellowish, three brown stripes . . . . **particeps** n. sp.

24. Thorax yellowish . . . . 25.

Thorax brownish . . . . 26.

25. First segment of palpi yellow . . . . **helva** Doane

Palpi wholly brown . . . . **gracilis** Doane.

26. Thorax with a narrow median lighter line . . . . **brunnea** Doane.

Thorax with yellowish or brown stripes . . . . . . **distans** O. S.

27. The cross vein separating the discal cell from the first basal cell is arcuated in such a manner that the inner end of the discal cell is but little more distant from the base of the wing than the inner end of the submarginal cell . . . **stulta** O. S.

This cross vein not so arcuated . . . . 28.

28. Thorax gray with a brown stripe in the middle . . . **liberta** O. S.

Thorax brown or yellowish . . . . 29.

29. Thorax brownish with a brown stripe in the middle **haeretica** O. S.

Thorax brownish . . . . 30.

30. Stigma distinct . . . . **stigmata** Doane

Stigma indistinct . . . . **moniliformis** Doane

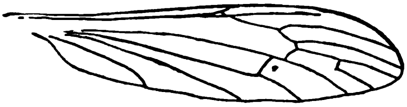
31. Wings immaculate . . . . 32.

Wings spotted with brown 34

32. No vestige of a stigma . . . . **globithorax** O. S.

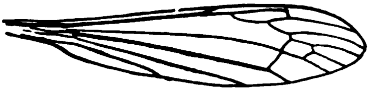
Stigma distinct 33

33. Stigma brownish; wings with a slight pubesence in the apical portion. **pubipennis** O. S.
Stigma pale; wings without pubesence . . . . **cervina** n. sp.
34. Wings brownish, three or four brown spots along the anterior margin . . . . **rara** O. S.
Wings with brown dots in all the cells . . . . 35.
35. Markings on the wings intense; lobes of the hypopygium rather elongated and deeply incised on the inner margin. **simulans** Walk.
Markings on the wings less intense; lobes of the hypopygium not incised . . . . **duplicata** Doane.



Dicranomyia viridicans n. sp.—Greenish; head somewhat darker above; palpi and antennae light brown; first two segments of the latter much paler; thorax and abdomen wholly brownish green; the large lobes of the hypopygium brighter green, their inner margins furnished with a strongly chitinized reddish three-pronged appendage; halters whitish; legs greenish, femora somewhat lighter towards the base; wings whitish hyaline; stigma pale; subcostal cross-vein near the tip of the auxiliary vein, which is opposite the origin of the praefurca; veins greenish; discal cell closed, three times as long as wide; great cross-vein some distancc before the inner end of the discal cell. Length 5mm., wing 9 mm.

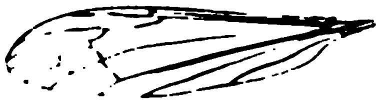
Hab.—Stanford University, Cal. One male.



Dicranomyia particeps n. sp.—Brownish yellow; head yellowish, brownish above; rostrum yellow; palpi brown, first segment yellow; antennae brown; thorax yellow with three brown stripes above; scutellum and metanotum grayish; halteres long, brownish, yellowish at the base; legs brownish, feet darker; abdomen brownish, yellowish below; posterior margin of each segment lighter; the tergum of the hypopygium somewhat tumid, with a very narrow median black line, pleura very much smaller than the tumid lobes; upper valves of ovipositor slender, arcuated, lower valves stronger, almost straight; wings long and narrow, hyaline; auxiliary vein ending a short distance before the origin of the praefurca; the distance of the subcostal cross-vein from the tip of the auxiliary vein about equal to the length of the praefurca; stigma faint brownish; discal cell closed; great cross-vein at its inner end. Length 6 mm., wing 7 mm.

Hab.—Keyport, Wash. Nine males, six females.

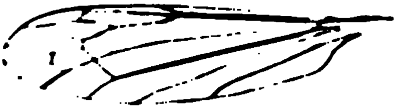
This species shares with *halterata* and *adjecta* the extra long halteres. From this latter it may be distinguished by the position of the subcostal cross-vein and from the former by the body being more yellow, wings narrower and in having three brown stripes on the thorax. In *halterata* the pleura of the hypopygium are quite as large as the lobes that are appended to them, while in *particeps* they are much smaller than the lobes.



Dicranomyia adjecta n. sp.—Yellowish brown; head, rostrum, palpi and antennae darker brown; first three joints of the flagellum rather globular, others more cylindrical, all distinctly pedicellate; thorax yellowish brown; dorsal stripes faintly or not at all indicated; pleura yellowish, with a broad, brown band from the collare to the base of the halteres; halteres long, infuscated; coxae yellowish; legs tawny; extreme tip of the femora lighter; tarsi darker; abdomen brown, lighter below; basal lobes of hypopygium dark brown, lamella lighter brown; ovipositor ferruginous, blackish at the base; lower valves straight, rather heavy; upper valves more slender, slightly arcuated; wings hyaline; veins and stigma brown; auxiliary vein reaching a little beyond the origin of the praefurca, subcostal cross-vein at its tip, first longitudinal vein fading out a little beyond the marginal cross-vein before reaching the margin of the wing; discal cell closed. Length 7 mm., wing 9 mm.

Hab.—Stanford University, Cal. Two males, two females.

May at once be distinguished from *halterata*, which it resembles somewhat, by the position of the subcostal cross-vein.



Dicranomyia cervina, n. sp. Brown; head brownish, darker above, rostrum yellow; palpi and antennae brown; thorax brownish, the dorsum with three darker brown stripes, the median one extending over the collare; scutullem and metanotum grayish brown; legs tawny, tarsi and the tips of the femora and tibiae darker; halteres whitish, infuscated toward the tips, knobs brown, abdomen brown, much lighter below; hypopygium yellowish brown; tergum but little swollen, pleura about as large as lobes, basal half yellowish, distal half brownish, ventral style strongly recurved at the tip, wings with a very light brown tinge, stigma pale, indistinct, tip of the auxiliary vein beyond the origin of the praefurca, distance of the subcostal cross vein from the tip of the auxiliary vein equal to one half the length of the praefurca; discal cell closed. Length 7 mm., wing 8 mm.

Hab.—Stanford University, Cal. One male.

I have the following species from localities not recorded in Aldrich's catalogue.

D. longipennis Schum. N. H.; Wash. Not recorded from the Pacific coast heretofore.
D. citrina Doane. Stanford Univ., Cal.
D. immodesta O. S. Rigaud, Canada.
D. padica O. S. Rigaud, Canada.
D. liberata O. S. Pa.; Mass.
D. halterata O. S. Stanford Univ., Cal.; Keyport, Wash.
D. vulgata Berg. Wash.
D. stigmata Doane. Stanford Univ. and San Mateo, Cal.; Keyport, Wash.
D. marmorata O. S. Stanford Univ. and Pacific Grove, Cal.; Keyport, Wash.
D. duplicata Doane. Cold Springs, Col.; Pullman, Wash.

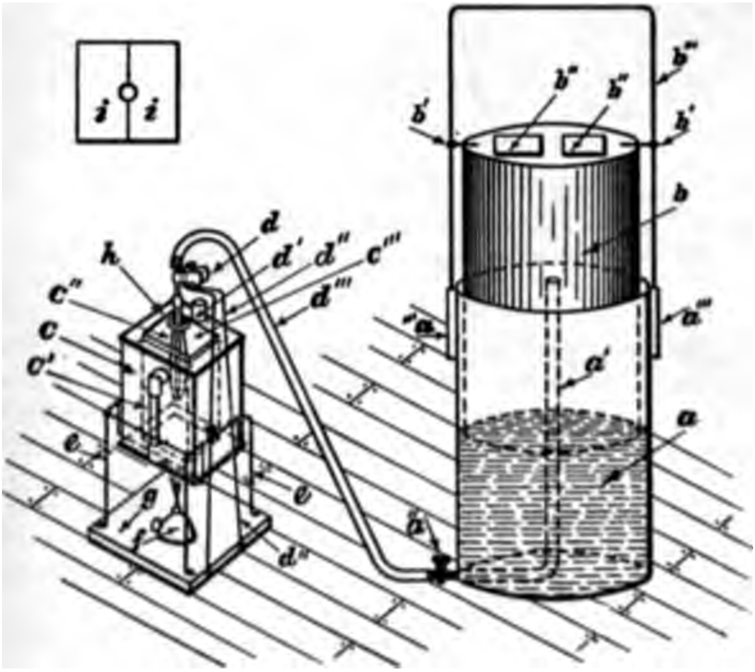
The Inflation of Larvae.

BY FRANK A. MERRICK.

The growing interest in the breeding of Lepidoptera from the egg, working out life histories, or from the larvæ to secure perfect and authentic imagoes for the collection, emphasizes the importance of preserving the larvæ for future comparison.

The advantages of inflated larvæ over those that are preserved in liquids are manifold, possibly the chief of which is the ability to pin each species in the cabinet with its imago, thus greatly enhancing the value of the collection.

In taking up the inflation of larvæ at the Merrick Museum a few weeks ago, we found that, so far as we could ascertain, the apparatus in use for that purpose, failed to meet the important, I might say vital, factors required of such apparatus, which we assume to be—First, that the arrangement for inflation of the skin shall be susceptable of the most delicate adjustment; that it shall be instantly changeable to a greater or less pressure; that the pressure shall be constant as to force, and automatic. Second, that the temperature of the oven shall be equally controllable by the operator, and that it shall be impossible to produce a heat that shall scorch the most delicate skin, producing discoloration, or singe the hair of the hairy forms. Third, economy of time. Fourth, economy in cost of making the apparatus. We at once proceeded to experiment with a view of devising a tank and oven that should meet these four requirement, and from old tin cans produced an oven and tank that, after Mr. Henry Engel has inflated hundreds of larvæ, from the monstrous Samais (which we call the "Ox Roast") to the tiniest Micro, has met all the requirements mentioned, not the least being economy of time. All the time required is for cleaning the larva and placing it on the blow pipe; you can then turn your attention to other



a, bottom section of tank 12 x [illegible] in. half filled with water as shown; a', tube leading air to blowpipe; a'', stopcock to shut air from blowpipe; a''', sockets to hold guide rod; b, top section of tank [illegible] in.; b' b', screw eyes soldered to top of b to slide on guide rod b'''; b'' b'', weights to regulate air pressure by adding or removing; b''', guide rod [illegible] in. round iron, to keep upper tank perpendicular in center of lower tank; c, outer shell of oven [illegible] in. high; c', glass gauge tube to show amount of water in boiler; c'', blowpipe in position for drying larvae; c''', inner shell of oven [illegible] in.; d, spring clip to hold blowpipe; d', tube [illegible] in. to fill boiler and allow escape of steam or vapor; d'' d'', wire support to which clip is soldered; d''', rubber tube [illegible] in. from tank to blowpipe; e, wire frame to support oven; f, alcohol lamp or gas jet to heat water; g, block to support oven; h, ring in blowpipe to clamp larvae; i i, glass cover made in two pieces to cover oven, allowing operator to see larvae and retain the heat.

matters, and no harm will result if left in the oven an hour or two a day.

We shall be pleased to furnish (free of cost) a sketch of our tank and oven in detail to those interested in the preservation of larvæ, upon application, hoping thus to stimulate a more general interest in this very important branch of the study of lepidoptera.

We shall be pleased to exchange inflated or live larvæ with those interested during the coming season.

Please address Merrick Museum, New Brighton, Pa.

Annihilating the Codling Moth.*

PROF. A. L. MELANDER, Pullman, Wash.

To trace step by step the advances made in the fight against the codling moth is an instructive lesson of the importance of applied entomology. Here is a pest that for ages has rendered almost worthless a large percentage of the apples the farmer produced. The money loss to the community annually mounted to the millions of dollars, and before the days of economic entomology there was no method of checking this enormous drain. Early study by the entomologist showed the tree-descending habits of the mature worm, and gave the hint of trap bands to be placed around the trunk. These bands trapped somewhat less than one-half of the worms, but did not protect one-half of the fruit crop.

The discovery of Paris green and the invention of the spray pump added more to the crop, but the strength of the spray, the number of sprayings necessary, and the dates of their application had all to be determined by laborious experiment. In the early days of Paris green, scarcely forty years ago, it was considered an achievement to save sixty per cent. of the crop, even if a dozen sprayings were given.

Further study of the moth's life history indicated that three or four sprayings properly timed were all that were needed. Experimental applications of various insecticides showed that arsenate of lead was superior to Paris green. The advent of high pressure power sprayers enabled the use of weaker sprays than had heretofore been thought desirable. By these various steps the savings mounted; eighty per cent. became ninety per cent., and then ninety-five per cent., until two or three years ago even ninety-eight per cent. could be counted on.

---

* Contribution from the Zoological Laboratory of the State College of Washington.

This past season in concluding a series of investigations on this pest that have been in progress for a number of years, the State Experiment Station of Washington eclipsed the record. Modern power sprayers, working at two hundred pounds pressure, forced a dilute spray into every flower cup. As fast as the worms entered the cups they were poisoned. The annihilation of the first brood of larvæ was almost complete. In a seventeen-acre orchard that had 400,000 wormy apples in 1906, but 170 worms were taken from the band-straps this year, indicating that but four hundred worms escaped the first spraying. Even under the best conditions of reproduction the second brood in this orchard could not have exceeded eight thousand worms or eighty boxes of apples. But, as two other sprayings were given to poison the second brood the calculated eighty boxes were reduced to six, one-tenth of one per cent. of the crop.

To give the two sprayings for the second brood cost $100, which was more than the increased saving amounted to. In other words, a single complete spraying is now considered all that need be necessary to suppress the codling moth, no matter how wormy the orchard previously was. This sentence must be read carefully, it means much more than simply spraying It means thorough spraying, at a certain date and in a way that the fruit grower ten years ago did not dream of. The spraying must be given within a few days after blossoming time A coarse spray is forcibly shot from Bordeaux nozzles only, drenching the tree through and through Arsenate of lead alone is used one pound to fifty gallons, or in some of our tests even as weak as one pound to eighty gallons. The idea now is that the poison is better distributed when carried by much water thrown with great force than when used as the misty concentrated spray prevalent a few years ago Another important point has been brought out, on which the success of a single spray will largely depend. Previous experimenters have insisted on the necessity of spraying for the second brood if wormy orchards are near. We believe, however, that normally the codling moth breeds generation after generation in a most restricted area, that it may even be said to have a home-tree. If, therefore, all the worms in an orchard be exterminated, the chance for outside re-infection under ordinary conditions is small.

In the evolution of this fight against the codling moth, banding was first thought of. Then this was supplemented by spraying. The spraying became of most importance, and in time supplanted banding. In the development of spraying methods, the misty concentrated spray of the hand pump was replaced by high-pressure spraying, and the number of haphazard sprayings was continually cut down, until to-day we believe that a single spraying can be made completely effective if thorough and on time, the maximum saving at the minimum cost. Through the study of a few decades economic entomology has enabled the farmer to save his entire crop instead of losing all,—an unselfish investigation that has added an untellable measure to the world's good.

◆

I WOULD be glad to get material in the Noctuid genus *Homoptera* and its allies from all parts of the country for study in the preparation of a revision of this series. I will name and return specimens promptly, for the privilege of retaining such as may be needed in completing the work.—JOHN B. SMITH, New Brunswick, N. J.

TELEA POLYPHEMUS.—This moth is quite common in California. The preferred food plant appears to be the Live Oak (*Quercus agrifolia*), a non-deciduous tree. For this reason it would be of little advantage for the pupa to fall. The foliage of the Live Oak is dense and detection of the cocoon is difficult. I have never known any other than attached cocoons from this locality. I have found several which were attached by a short silken pedicle similar to that of *promethea.* In one instance this stalk was about an inch and three quarters in length. A similar case of such a specialization is described by Grote in the Proceedings American Philosophical Society, Vol. XII, 401, 1902. Besides *Quercus,* the larva feeds on *Rosa, Prunus* and others. *Polyphemus* is badly parasitized here by *ichneumonid, tachinid,* and *braconid* flies.—KARL R. COOLIDGE.

A new Eriocrania (Lepidoptera) from the Pacific Coast.

By Francis X. Williams, San Francisco, Cal.

(Plate II)

In early March, 1905, I had the good fortune to capture several examples of an *Eriocrania* (*Eriocephala*), which Mr. Busck, of the U. S. National Museum, pronounces to be a new species. The specimens, ten in all, were caught at the base of Mt. Tamalpais, in Marin County, in a small grove of oaks (*Quercus agrifolia*). They were in good condition and captured rather early in the morning, being disturbed from the trunks of trees. Their flight is rather weak, but hard to follow on account of the small size of the insect. When taken they sometimes feign death, as is often the case in *Hepialus*, folding their wings like a caddis-fly.

Five of the specimens were dissected for anatomical study and another was accidently destroyed, leaving four specimens in good condition.

Eriocrania cyanosparsella n. sp.

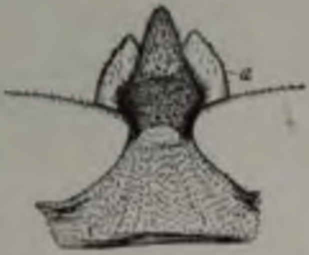
Head covered with coarse, light gray hair; antennæ dark golden, more than half the length of the primaries Primaries metallic golden with purplish patches showing rusty golden in some lights, and forming three rather irregular oblique bands across the wing, the outer extending across the base of the outer third of the wing and having a short, interior parallel band at the outer angle, the middle band diffusing costally, and being the plainest of the three, the inner band in the basal third most evident at the costa, its lower half broken and represented by one patch on the inner margin Purple patches scattered about the apex, along the outer margin, and basally on the costa All purple showing cyaneous blue scales in certain lights Secondaries golden, becoming translucent towards the base, outer half purplish, especially apically A strong rusty, golden tinge is probably faded purple Blue scales sometimes reflected Fringes pale metallic gray, golden at their outer half on the primaries Body more than half as long as primaries, covered with long, light gray hair Legs elongate and spurred. Expanse 11.60 mm

Type 1 ♂ ; Cotypes 3 ♂ ♂ , in the collection of the author.

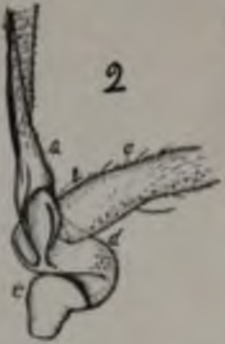
There is some variation in the intensity and arrangement of the bands on the primaries, these being heavier in some and more numerous or less in others, but they agree with the type in fundamental pattern. The expanse varies from 10 to 14 mm.

The mouth-parts and wing venation illustrated on the plate, show well the primitive character of the *Micropterygidæ*.

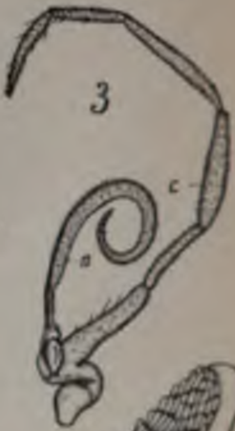
1



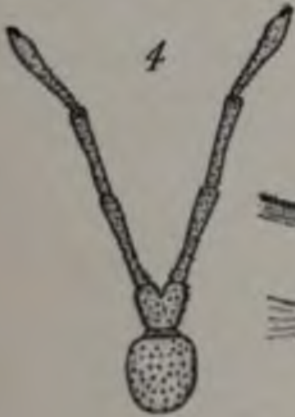
2



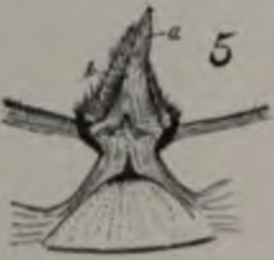
3



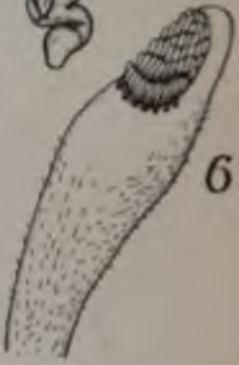
4



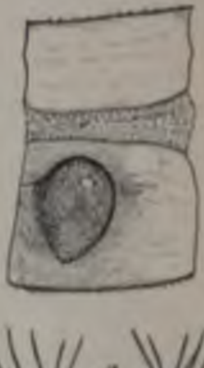
5

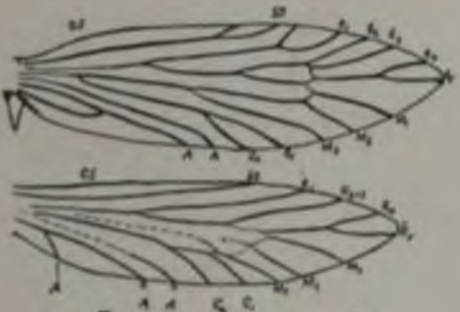


6



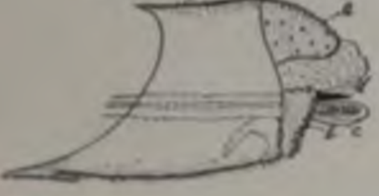
8



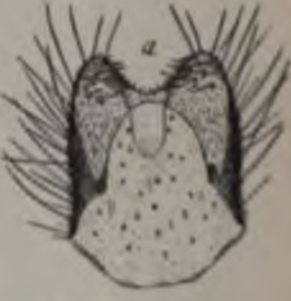


7

9



10



ERIOCRANIA CYANOSPARSELLA n. sp.

The somewhat spatulate labrum is well chitinized for its basal half, especially laterally, and bears a number of slender scales removed in the figure, which shows the cavities into which these scales fitted. The distal portion of the organ strongly suggests an epipharynx, which, however, arises from the underside of the labrum, and is fused with the latter for some distance.

The weak and functionless mandibles are partly concealed by the labrum.

The maxillæ have the elongate curved lacinia well developed and are probably not altogether functionless, and represent the primitive proboscis. The galea is furnished with a heavily chitinized dorsal ridge. The stipes and cardo are represented by the unjointed basal portion of the maxilla.

The elongate, six-jointed maxillary palpus has an unnatural curve in the figure and should be recurved from its middle under the head.

The labium has the mentum subquadrate, and the submentum bifurcate, and bears long, slender scales. The palpus terminates in a curious structure almost apically situated. This is represented in Fig. 6 and consists of a rather oval pit from which arise a number of clavate hairs, probably having an olfactory function.

The venation is shown in Fig. 7, where it will be noticed that the jugum is quite large, and that in the fore-wing the radius is six-branched. A curious flap-like organ, possibly a secondary sexual character, is situated on each side of the sternum of segment 4 of the abdomen.

EXPLANATION OF PLATE II.

Fig. 1. Labrum, *a* mandible.
Fig. 2. Maxilla, *a* lacinia, *b* galea, *c* max. palpus, *d* stipes, *e* cardo.
Fig. 3. Maxilla, *a* lacinia, *c* max. palpus.
Fig. 4. Labium and palpi.
Fig. 5. Labrum, from below, showing epipharynx *a*, *b* labrum.
Fig. 6. Pit with clavate hairs, 3d seg. lab. palpus.
Fig. 7. Wing venation.
Fig. 8. Fourth segment of abdomen showing flap-like organ.
Fig. 9. Terminal segment and genitalia, *a* valve, *b* harpe, *d* penis, *c* penis sheath.
Fig. 10. Ventral view of valves (*a* Fig. 9).

Notes on the Orthoptera of Raleigh, North Carolina.

BY C. S. BRIMLEY.

The following notes on our Orthoptera relate chiefly to the seasonal distribution of the different species and the various situations in which they are found.

Family FORFICULIDÆ

Anisolabis azteca so far only found under stones in November. *Labia minor* attracted to lights in summer, and once found under rubbish in winter. *Spongophora brunneipennis* under bark of dead oaks in both summer and winter, nymphs also taken at the latter season.

Family BLATTIDÆ

Ischnoptera major is found in both the adult and nymphal stages under the loose bark of dead pines, both prostrate and upright, and also under the bark of stumps. It seems to prefer the space under the bark to be rather damp.

Ischnoptera couloniana is found in both stages under loose bark of upright dead pines, and only when the space under the bark is dry.

Our other native roaches, viz.: *Ischnoptera uhleriana, I. johnsoni, Temnopteryx deropeltiformis, Kakerlac schaefferi,* and *Ceratinoptera lutea* are all found under the thick covering of pine straw lying on the ground in pine woods.

The seasonal range of our native roaches appears to be much the same with all our species, viz.: from May to August, although the last four named have so far been only observed up to late June or early July.

Family PHASMIDÆ

Our three specimens of *Diapheromera femorata* were taken in September and October.

Family MANTIDÆ

Mantis carolina flies at dusk from the end of August to the middle of October. The egg masses are attached to twigs or not unfrequently to the trunk of a dead tree under the loose bark.

Family ACRIDIIDÆ

Subfamily TETTIGINAE

Tettix arenosus, Paratettix cucullatus, and *Tettigidea lateralis* overwinter in the adult form and *Neotettix bolivari* in the nymphal stages. *Tettigidea lateralis* occurs throughout the whole year, but I have not yet got sufficient data as to the others. In late fall and early spring all the forms occur in drier situations than during the hotter portions of the year.

Subfamily TRYXALINAE

Amblytropidia occidentalis overwinters in the adult form, having been taken in or close to woods from October to May.

Eritettix navicula overwinters in the nymphal stages, the nymphs being rather common in late fall, while the adults have only been taken in April and May in broom straw near water.

Our other species all apparently overwinter in the egg state and their seasonal range is about the same, viz.: from July to November. Of our four species *Orphulella pelidna* is very common in grassy places in and near pine woods, *Dichromorpha viridis* and *Syrbula admirabilis* are liable to occur in long grass almost anywhere except in the marshes, and *Tryxalis brevicornis* is strictly confined to grassy marshes.

Subfamily OEDIPODINAE

Arphia sulphurea and *Chortophaga viridifasciata* overwinter as nymphs, and all the others in the egg stage.

The two *Arphias, Spharagemon bolli,* and *Chortophaga viridifasciata* occur in grassy places in or near woods, the latter form ranging more or less commonly throughout the whole season from April to November. *Arphia sulphurea* has been taken from April to August and *A. xanthoptera* from September to December, while *S. bolli* ranges from August to November.

Our two *Hippisci* occur in grassy fields, *phenicopterus* occurring from late May to the end of July, and *rugosus,* which seems to prefer longer grass than its congener from early August to late November.

Dissosteira carolina and *Trimerotropis citrina* frequent dusty roads and bare fields from June (*Dissosteira*) or July (*Trimerotropis*) to early December. The latter species seems to be seldom found away from roads except in the latter part of its seasonal range, and is furthermore the only Acridiid which I have noted as being attracted to lights.

Subfamily ACRIDIINAE

Leptysma marginicollis apparently overwinters as adult, and is confined to marshes except in late fall when I have collected it on dry ground among broom straw (*Andropogon*). Apparently ranges through nearly the whole year

Of the three Schistocercae found here, *alutacea* occurs chiefly on the uplands from early August to early October, not overwintering in the adult stage like the other two species, while *damnifica* has been taken from mid September to late April, its habits in winter being similar to those of *americana*

S. americana, our third species, occurs throughout the entire year, the nymphs which are dimorphic in color, some being brown and others green, transform to the adults from the end of August to the middle of October The adults leave the fields and take to the woods during the winter and are liable to be on the wing on any comparatively warm day. In spring they leave the woods and take to the fields again, being found in May and June on crimson clover and grain; about this time the sexes are found in coitu In July and August their numbers rapidly diminish, but old adults were brought me in September, 1907, at the same time as newly transformed specimens.

Of our *Melanopli atlanis* occurs in grassy fields from June to December, an occasional specimen lingering on till January; while *femur-rubrum* only occurs from September to late November though very abundant in grassy fields at that season. The other two common species, *keeleri* and *scudderi*, occur in or near pine woods mostly, their range being from mid-August to early December though I took specimens of the latter on January 21 and 22, 1907. Our only other form *punctulatus*, occurs in pine woods, but we have only taken four specimens (on October 9 and 10, and November 5, 1907).

Paroxya floridiana, our only other Acridiine, occurs in grassy and weedy marshes from mid-August to mid or late November.

Family LOCUSTIDÆ

Subfamily PHANEROPTERINAE

The two common Scudderiæ, *furcata* and *furcifera,* occur in woods, marshes, and to some extent in weedy fields from late August to early November, while *curvicauda* has only been taken in August and September.

Symmetropleura modesta has only been taken from mid-July to early August and the species may be arboreal, as it has been taken both at light and on sugar, but not in ordinary collecting.

Microcentrum laurifolium has been taken from late July till late September mostly on bushes and low trees. The nymphs have been taken on grape, buckeye, maple, genarium (cultivated).

Amblycorypha uhleri is found from early August to mid October among grass or tall weeds, usually in woods or partially shaded places.

Subfamily PSEUDOPHYLLINAE

The true katydid, *Cyrtophyllus perspicillatus,* our only member of this group, has been noted singing in the tops of trees, mostly oaks, from late June till late September. The few specimens that have been taken have been mostly on my back porch, where they seem to occasionally seek shelter.

Subfamily CONOCEPHALINAE

The species of *Conocephalus* have been taken mostly in long grass, but occasionally at lights in the house. Their seasonal occurrence is mostly in summer and fall, *triops* having been taken commonly from mid-August to early October, *palustris,* in marshes only, from early August till late October; *mexicanus* in both marshes and uplands, in October and May; *fuscostriatus* also in both marshes and uplands in late April, late August, and November; while our single specimen of *crepitans* was taken in my garden at dusk in August. Our only other determined species, *bruneri*, has been taken in late July and early August, and at least one of the specimens was taken in the house at night. It would seem from the above dates that *fuscostriatus* and *mexicanus* may possibly overwinter to some extent in the adult state, or possibly as large nymphs, the latter idea being supported somewhat by the fact that I have occasionally taken large Conocephali nymphs quite late in the season. A single unknown *Conocephalus* was brought me to-day, December 7, 1907, by my little boy.

Our four Orchelimums all seem to have about the same seasonal range, mid August to late October, but while *nigripes* is found here exclusively in the marshes, and *vulgare* on the uplands, *glaberrimum* and *nitidum* are found about equally in both situations.

Of the five Xiphidii, *fasciatum* is found on the uplands in grassy fields from mid-July till early November, *ensiferum* in the same situations and in marshes, from mid-August till early November, *saltans* in the uplands from late September till early December, and *strictum* in long grass in both lowlands and uplands from mid-August to late September. Our fifth species, *gossypii*, has been taken in both marshes and uplands, but mostly at dusk on the flowering stems of the ornamental grass, *Eulalia japonica variegata*, in my garden.

Subfamily STENOPELMATINAE

Our only species, *Ceuthophilus uhleri*, has been taken under stones in woods from mid-September to late February.

Family GRYLLIDAE

Subfamily GRYLLOTALPINAE

Of our two species, *Gryllotalpa borealis* has been found mainly in burrows near water when digging for any purpose in such situations, my only recorded dates being in April and May. *Ellipes minuta* has been taken on damp, loamy soil not far from a stream, in late April and in June.

Subfamily MYRMECOPHILINAE

Myrmecophila pergandei has been taken in ants' nests under logs or under bark from late October till late March, but not yet in an ants' nest under a stone.

My single specimen of *Cycloptilus squamosus* was taken on the ground near a marsh in August, and two specimens of *C. americanus* were taken in late October in pine woods, apparently flushed from under the pine straw while I was scraping it away to look for myriapods. The male had wings and a longer pronotum, while the female was wingless, and had the pronotum shorter, but was larger than the male.

Subfamily GRYLLINAE

Of our Nemobii, *fasciatus* has been taken in open fields from early July till early December; *canus* in pine woods from early September to late November; *maculatus* in mixed woods in October and November; *exiguus* and (or) *carolinus* in damp places both lowland and upland, usually under stones or rubbish, from early September to early December; and *confusus* in damp places not far from water from mid-August to late November.

Gryllus pennsylvanicus is found in fields and woods from early April to late September, but overwinters as a nymph.

Subfamily OECANTHINAE

Oecanthus 4-punctatus is found on low plants from late June to mid-November, and *latipennis* in similar situations from early September to early November.

Subfamily TRIGONIDIINAE

Anaxipha exigua has been taken on low plants in the marshes in August and September. *Phylloscirtus pulchellus* on shrubs near water in September, and has been observed on alder, willow and cotton. *Cyrtoxipha delicatula* has been once caught in the window of my house, so it was probably attracted by the light.

Subfamily ENEOPTERINAE

Orocharis saltator has been taken on bushes in woods in September and November and once on the ground in woods in the latter month. Two well-preserved specimens were found dead under stones in December and February respectively.

Apithes agitator has been taken in woods on bushes, only in September.

Notes on the Larval Habits of Culex perturbans.

By John B. Smith, Sc. D.

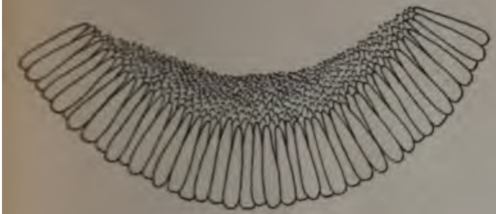
(Plates III, IV)

The larva of *Culex perturbans* has eluded the search of all that have sought it up to the present time. Goeldi found a closely allied species in South America, and from the eggs secured the first stage. Beyond that he could not carry them and all died without feeding. Dr. Dyar had the same experience with *perturbans*, the first stage and egg-boat of which he secured in captivity and described. Our experience in New Jersey was not different, and in my report for 1906 I gave an account of what had been theretofore learned concerning this elusive creature.

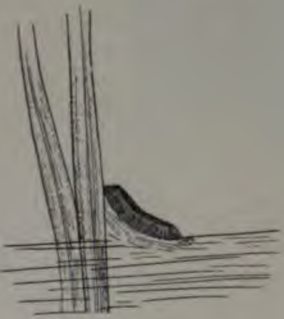
Our experience had very greatly narrowed the scope of the investigation, by eliminating all the usual breeding places and methods of other mosquitoes and had pointed very strongly to certain permanent bodies of water containing considerable vegetation.

Perturbans is not usually a common species and the only locality from which I have annually received it in large numbers is Lahaway, in Ocean County, the collector being my old friend, J. Turner Brakeley, who has done so much to help along this mosquito investigation. He did not fail to obtain them again in 1907, and sent them in by the hundred during July. As I was unable to get to Lahaway myself, at that time, I sent Mr. John A. Grossbeck to make the hunt for me on July 31st, and accompanied by Mr. Brakeley, who pointed out the most likely places, Mr. Grossbeck found that eggs were laid in rafts on the surface of the water in densely grass or sedge-covered areas and that these boats sank readily when disturbed unless supported against a stalk or blade of grass. Sixty-nine egg boats were taken from one pool 25 x 35 feet, and others were found in similar areas. A few very young larvae were found, but not under such conditions as to indicate their actual habits.

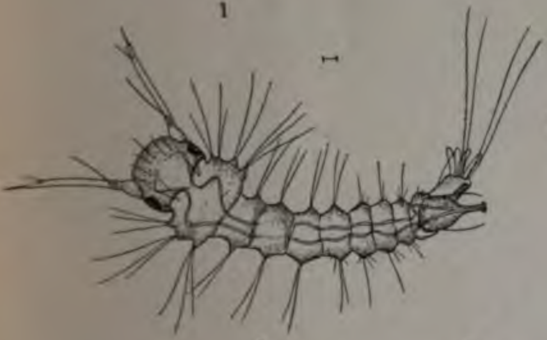
With this knowledge Mr. Grossbeck succeeded in locating another swamp area near Trenton, 6 or 7 acres in extent, in which egg boats were also found in some numbers.



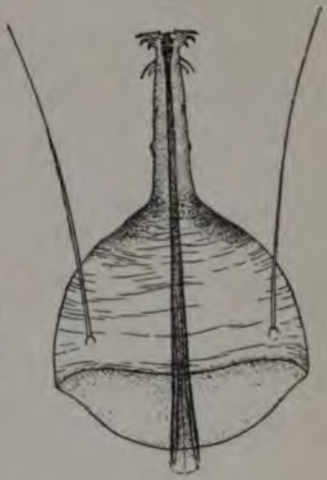
1



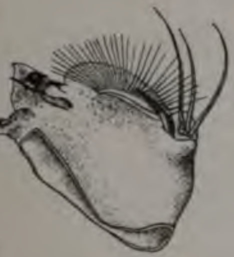
2



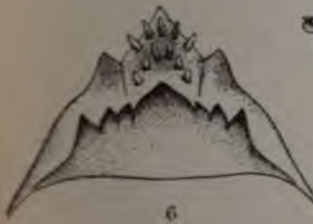
3



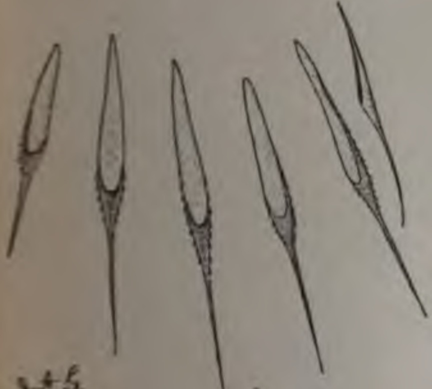
7



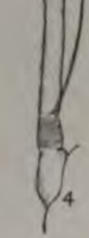
5



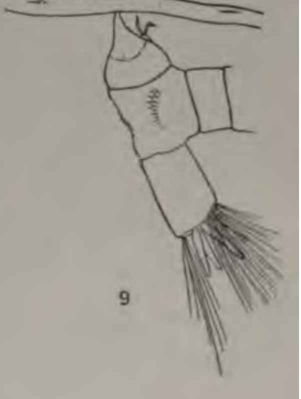
6



8



4



9

J. A. S.

CULEX PERTURBANS

As it was considered almost certain that the larva hibernated, the matter was dropped until fall, and in September, Mr. Brakeley again began work. I had discussed the matter with him and had suggested that the insect must be attached, somehow, to some object, vegetable or animal, in such a way as to keep it permanently submerged; and so water plants were first examined, without result. Finally, on September 21st, an entire bunch of grass was taken up from the bottom, mud and all, and was washed out in a large beaker and graduate. From this several larvæ in the second and third stage were obtained and sent to me. The clue was now in hand, and Mr. Grossbeck was sent to Trenton, September 27th, and in two hours he had over forty larvæ, ranging from stages 2 to 4, and we knew just where the insects were found. Sections of sod from the swamp were brought into the Laboratory and placed in large battery jars, and soon we had over 100 larvæ under observation.

Briefly stated, the larva of *perturbans* lives in swamp areas, densely grass and reed-covered, some two to four inches below the bottom surface, and attached by the anal siphon to the roots of grasses which have a very open vascular texture. They can only be obtained by getting the net *under* the tufts of grass roots and scooping about, so as to dislodge the attached larvæ. Judging from our experience the infested areas must be covered by at least four inches of water, and when the water gets a foot deep and more open, no more larvæ are found. It is the grass-root system and not the mud that is sought, as I demonstrated at Lahaway early in November. Here the pool where Mr. Grossbeck had collected the eggs had become much deeper from late rains, and the mass of bottom vegetation had separated and was floating about 6 inches from the bottom. It was possible to break through the sod so as to get beneath it, and with a small net, to scoop along the bottom of the root-mass and from these roots I secured from one to five specimens in every trial made; but from the mud in the bottom I obtained nothing.

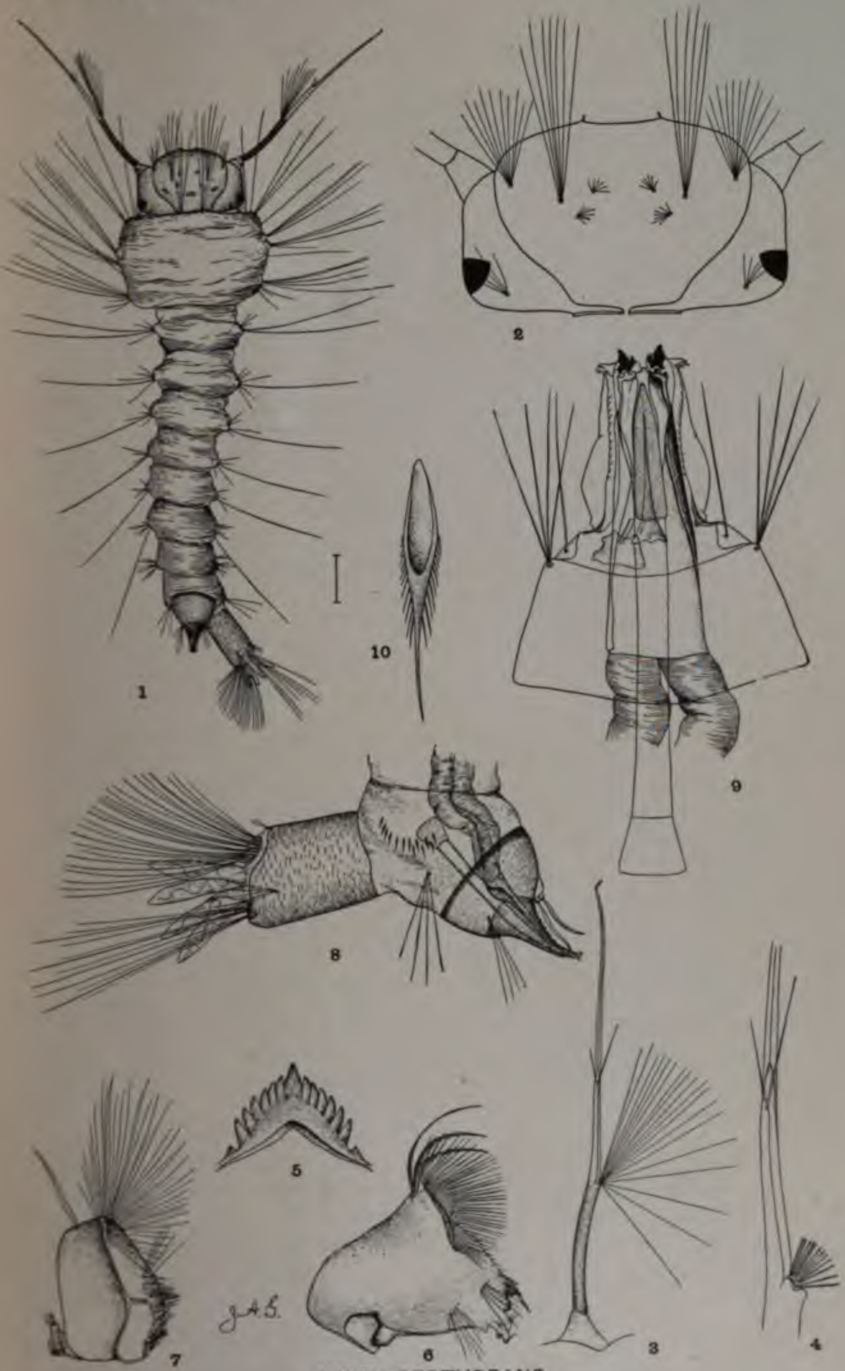
The life cycle of this peculiar species is not yet complete, as the pupa has not been found; but enough is known to make it certain that there is only one annual brood and that hibernation is in the larval stage.

Mr. Grossbeck has prepared the following description of the larva ready for hibernation and apparently in the last stage, though probably not quite full grown. The illustrations will supplement the description.

Description of the larva (Pl. IV, Fig. 1):

Length, 6 to 7.5 mm. = .24 to .30 of an inch from head to end of ninth abdominal segment It is a robust wriggler resembling in life the larva of *Culex jamaicensis*. In color it is white tinged with a clear transparent green which is often the predominating hue. The head is pale brown, much broader than long, rounded in front and flat at the sides; four large and four small tufts of hair arise from the vertex, two of the large ones of 6 or 7 hairs each from the central portion, between which the four small tufts are situated, and one of 10 or 11 hairs near the base of each antenna. Of the small tufts the anterior pair are each composed of 6 hairs, the posterior pair of 7 each. There is also another pair of moderate sized hair tufts near the base of the head just below and inward of the eyes; these are composed of five hairs each. The eyes are remarkably small, black, and placed far down on the sides of the head. The antenna (Figs 3 and 4) is very long and somewhat filamentous, infuscated at basal third and almost colorless beyond; a large tuft of 18 to 20 long hairs arises from an offset at the basal third and from this point the shaft is continued for some little distance apparently as a thickened side of a hollow tube which is open on one side to the apex of the main shaft; this apex is terminated by two long needle like spines and the filamentous process has at its end a very small articulated spine. The mentum (Fig 5) is triangular in form with a deeply excavated base and six large teeth on each side of an apical one besides a small tooth which is sometimes present near the base The mandible (Fig 6) presents much the appearance of that of the ordinary *Culex* (sens lat) type but has three curved dorsal spines and the teeth are small and situated some distance back from the apex The maxillary palpus (Fig 7) offers little that is peculiar, but the subapical spine is exceptionally long and blade like and the basal process is rather small with curved apical teeth

The thorax and abdomen are normal in form, the former with the usual number and location of long hair tufts; but the abdomen has only one tuft of two hairs on each side of the first segment, the following five each having but a single long lateral hair, while segments 7 and 8 have none except the several short hairs which are common to all segments The eighth segment bears the lateral patches of scales,



CULEX PERTURBANS

each of which is composed of from 12 to 16 scales, arranged in an irregular, partly double row. The individual scale (Fig. 10) is lanceolate with a long apical spine and fringes of small spines at the sides. The ninth segment is somewhat variable in length, but is always longer than broad and is completely encircled by a light brown chitinous ring. The ventral brush is normal, but the dorsal hair tufts are four in number instead of the usual two. The anal gills are slightly longer than the width of the ninth segment and are supplied with obvious trachea. The breathing tube (Figs. 8 and 9) is a highly complex organ representing an extreme modification of the ordinary anal siphon. In color it is pale brown with the extreme base and apical half strongly infuscated. From a dorsal aspect (Fig. 9) it is bottle shaped* with the basal half greatly dilated. From the side the apical half curves slightly dorsally and two long blade-like spines arises from large papillæ situated on a distinct dorsal offset. The constricted portion of the tube is provided within with projecting flaps which appear to hold the inner chitinous tube in position. The apex of each lateral set of flaps is furnished with six horizontally extended hooks. The inner tube, to which the tracheæ are attached at its base, is a complicated structure in itself, being composed of several distinct pieces. A small elongate piece forms the ventral wall while another much larger piece extends curvedly from one edge to the other. From the apex of the tube thus formed extend two small tubular structures terminated at their apices by an articulated, irregular, corneous piece which, by the action of the long, somewhat chitinous piece coming from the interior of the eighth abdominal segment is capable of being thrust forward and horizontally outward. Another separate little piece on the dorsal side of the main inner tube has a serrated edge which is plainly seen from a side view of the entire siphon.

EXPLANATION OF PLATES.

PLATE III.

Fig. 1, egg-boat of *Culex perturbans;* 2, position of egg-boat on water when supported by a grass stalk; 3, young larva just out of egg; 4, antenna of same; 5, mandible; 6, mentum with hypopharnyx; 7, anal siphon; 8, lateral patch of scales; 9, method of attachment of the larva to a grass root: all more or less enlarged: original.

PLATE IV.

Fig. 1, well grown larva; 2, head, showing position of hair tufts; 3, antenna; 4, portion of same enlarged; 5, mentum; 6, mandible; 7, maxillary palpus; 8, caudal segments of larva; 9, anal siphon; 10, single scale from lateral abdominal patch; all much enlarged: original.

---

* The drawing was made from a balsam mount and is consequently much broader and and the outline distorted.

Notes on some Angolan Insects of Economic or Pathologic Importance.

By F. Creighton Wellman, Benguella, West Africa.

From my collecting notes on over a thousand species secured in Portuguese West Africa during the past two or three years, I have selected extracts concerning some that are useful or inimical to man, hoping that my observations may prove interesting and possibly in some degree novel. I have confined the list to a few of the more striking species. Several of the insects have been reported by me on previous occasions, and references are given to some of these publications. It is highly probable that part of the observations have been recorded before by others, as it is of course impossible to consult either books or periodicals while in West Africa. The numbers preceding the names of the insects indicate the order in which they stand in my collecting record.

1.

No. 124. *Diplognatha silicea* McL. (Coleopt.)

This handsome Cetoniid, known locally as the "thatch beetle," is a great pest in a country where grass thatch is the common roofing material. *D. silicea* is a large beetle, perfectly black all over, with a beautiful jewel-like polish, as its name implies. It breeds in dry or damp grass, and almost every evening during the wet season the ♂ ♀ may be seen and heard buzzing clumsily about the eaves or top of a house. The grubs eat the thatch so that water penetrates and the roof rots in consequence. In one station their ravages were particularly annoying a few years ago, the roofs being ruined in a short time. In many places, however, the damage done is inconsiderable.

2.

No. 530. *Glossina palpalis wellmani* Aust. (Dipt.)

This subspecies is the southern representative of *Gl. palpalis* Rob. Desv. the carrier of African sleeping sickness. The distribution of *palpalis* in Angola affords an excellent example of the effect of climate on insect life. In the hot northern districts of the colony (Congo, Ambriz, etc.) *Gl. palpalis palpalis* only is found. In the intermediate somewhat cooler regions (Cazengo, Golungo-Alto, Ambaca, etc.) *Gl. palpalis palpalis* and *Gl. palpalis wellmani* are found side by side, while in the comparatively cool southern part of the province (Catumbella, Kubal and Cunene rivers, etc.) *Gl. palpalis wellmani* is found alone. From recent observations it appears that *wellmani* exists as far east as Lake Muero and the Dikulwe and Lufira rivers in the Congo Free State, and when sufficient additional observations are recorded they will probably prove that the fly extends right across Africa. This new subspecies of tse-tse fly has been proven to transmit human trypanosomiasis and is thus directly connected not only with the development of the country but also with the very existence of the native races. I have elsewhere published papers on the habits [*] and geographical distribution [†] of this fly.

3.

No. 635. *Phonergates bicoloripes* Stal. (Hemipt.)

This fine Heteropteron belongs to the Reduviidæ and has habits similar to *Opiscœtus personatus* L. except that instead of preying on *Clinocoris lectularius, P. bicoloripes* pursues a blood-sucking tick (*Ornithodoros moubata* Murray) catching it and mulcting it of its ill-gotten food. There would seem to be no doubt that this bug preys especially on *O. moubata* as I have taken several in the act and (while I have collected many African Reduviidæ) have never seen the one in question except in native kraals, which swarm with ticks, and have never found other species sucking the ticks. While various Reduviidae will fly to light at night, yet *P. bicoloripes* is the only local species I know of which actually lives in houses. *O. moubata* is one of the most persistent and troublesome suckers of human blood in Africa, its bite being very painful, to say nothing of the fact that it transmits human spirochætosis and filariasis. So the bug under discussion would be of interest even were it not that it is itself capable of inflicting a bite which is so severe that the natives compare it with that of a poisonous snake. I am elsewhere * publishing in full my notes on this interesting insect.

---

[*] Notes on the Habits of Tsetse-flies, Annals and Magazine of Natural History, Sept., 1906, p. 242.

[†] Neue Beobachtungen ueber die geographische Verbreitung von *Glossina palpalis* Rob.-Desv., Deutsche Entomologische Zeitschrift, Feb. 25, 1907, p. 199.

4.

No. 500. *Bostrychopsis cephalotes* Ol. (Coleopt.)

This species (known to the blacks as "Osekoseko") is, together with its allies, of vast economic significance. It is a wood borer which destroys most native "soft" woods, riddling them completely so that a timber will in time break of its own weight. There is an almost unlimited amount of timber in Angola that is of no value whatever because of this pest. Myriads of fine trees (*Berlinia paniculata, Brachystegia tamarindoides*, etc.) cannot be used on this account. There are fortunately a good many "hard" trees (*Pterocarpus erinaceus, Burkea africana, Balsamea mulelame*, etc.—also Ebenaceæ) which the borer does not touch. But these as a rule are more difficult to work than the "soft" kinds. I once made some experiments with this beetle. I found that boards, if sawed immediately after the tree is felled and then dipped in a long trough containing a weak solution of sulphate of copper, escape riddling. Another method is to soak them in a stream of water until they smell sour. Of course, the trouble in such procedures is that the boards warp badly for lack of proper seasoning.

5.

No. 525. *Heptaphlebomyia simplex* Theob. (Dipt.)

I have chosen this mosquito not only because it is a common and vicious blood-sucker, but also because my observations on it have a bearing on the vexed and unsettled systematic problems presented by the Culicidae, the which are now engaging the active attention of different zoologists. *H. simplex*, which in its general facies suggests *Culex fatigans* Wied., was known previous to the writer's collections only from ♀ specimens, which differ from all other known mosquitoes by having a distinct seventh scaled wing vein, upon which character Mr. Theobald has founded a new genus and a new sub-family.

---

* Deutsche Ent. *Zeitschrift.*

From some Angolan specimens bred from eggs by the writer, however, appears the remarkable fact, already discussed by me in another publication,[*] that the ♂ ♂ do not share this peculiarity. In these there is no true scaled seventh vein, but the sixth is bent at right angles near the edge of the wing. This instance serves to illustrate the dangers of sweeping systematic conclusions founded upon restricted data. *H. simplex* occurs in great numbers in the rainy season, usually in company with other mosquitoes, especially *Danielsia wellmani* Theob. and *Mansonia uniformis* Theob. It breeds in foul pools, the eggs being brown in color and laid in rafts.

6.

No. 877. ? *Natada amicta* Swinh. (Lepidopt.)

It is well known that the larvæ of some Lepidoptera defend themselves by means of stinging hairs. For instance, we have *Empretia stimulea* and *Automeris io* in America. In Angola there are a number of caterpillars with this habit. Three of these are especially venomous and belong respectively to the Limacodidæ (Micro), Arctiidæ (Macro) and Liparidæ (this latter resembling rather closely the larvæ of some Tortricidæ). I have repeatedly tried to breed out these caterpillars, but have never succeeded. I have seen the Limacodid larvæ very often in spots haunted by imagines of the species named at the head of this note, and have therefore provisionally connected the two forms. This caterpillar is locally called "Epuvi" and stings terribly. I once saw a severe case of urticaria in a white child following one touch of it.

7.

No. 140. *Brachytrypus membranaceus* Drury. (Orthopt.)

This giant cricket is dug out of its burrows in mealie fields by the native women, often in great numbers. One can sometimes see small basketfuls, wings and legs removed, ready for the pot—for they are esteemed a great delicacy. Native children often go about digging for these crickets, and not seldom get their fingers badly nipped in return, as the insect's mandibles are sharp and powerful and can draw blood. When a nest of driver ants (*Annoma arcens* Westw.) goes on a raid it is a sight to see the crickets (comparatively elephantine in size) driven from their holes, stridulating indignantly and struggling in vain to rid themselves from their foes.

---

[*] Uber einen auffallenden Sexual-Dimorphismus bei *Heptaphlebomyia simplex* Theob., Deutsche Entomologische Zeitschrift, Jan., 1, 1907, p. 19.

8.

No. 538. *Sarcophaga africa* Wied. (Dipt.)

This handsome, viviparous fly breeds in faeces, putrid meat, etc. I have elsewhere * published an account of experimental myasis which I produced in goats, using this species of fly and the allied *Sarcophaga albofasciata* Macq.

9.

No. 524. *Culex hirsutipalpis* Theob. (Dipt.)

This mosquito is not only a great nuisance but, like *H. simplex* (*vide antea*) is interesting for other reasons. The ♂ ♀ from this region differ from the type in having no pale band at the apex of the palpi, and Mr. Theobald's diagnosis of my first specimens was "*Culex sp. nov.* near *hirsutipalpis* Theob." A suite of specimens which I bred from eggs shows this sexual dimorphism to be constant and also reveals a remarkable variation in size, some individuals being a third smaller than the type. I have published some observations on the pupae † which occur in amazing numbers at the last of the rains. The eggs are black and laid in rafts. They breed out readily in captivity. I should say before leaving this mosquito that the figure of the ungues on p. 381 of Theobald's Monograph is incorrect.

10.

No. 137. *Schistocerca peregrinatoria* L. (Orthopt.)

The ravages of the pest in some parts of West Africa are almost incredible. I once witnessed the advance of the early wingless form through the Chisamba country to the east of Benguella. Hardly a green thing was left behind them. In the adult winged state they sometimes come in such numbers as to darken the sun. The blacks may then be seen running back and forth over their plantations in the hope of saving their crops from the voracious marauders. At night these locusts (native name "Olohuma") settle on trees and shrubs, sometimes in such numbers as to almost cover them, and they may fly so closely together that a certain number break their wings by striking their fellows and therefore fall helpless to the ground. The insects are eaten by lizards, small mammals and birds, especially a sort of plover, *Glareola nordmanni,* which apparently follows and feeds entirely on locusts. The native Africans, too, are very fond of them when roasted. They also kill them by dropping them into boiling water and then dry and store them away for future use. I have found a considerable per cent. of these locusts infested with a long thin nematode embryo (*Gordius sp.*). On one occasion, too, I found enormous numbers dying on the ground. I examined a number but could not discover the cause of their fate.

---

* [illegible] Med. [illegible] Research [illegible] Jan. [illegible] p. [illegible]

† [illegible] Entomologist, May, [illegible] p. [illegible]

11.

No. 626. ? *Drilus sp.* (Coleopt.)

A member of the Malacodermata (imago unknown) which I have repeatedly tried in vain to breed out. The larva is common, but in captivity dies without pupating. The grub is called by the natives "Ochisia," which is equivalent to *Noli me tangere!* It is greatly feared, because if one steps on it with bare feet the bristles with which it is armed pierce the thick skin of the sole and work into the flesh, causing pain, inflammation and even sloughing. One may hear a whole caravan of porters warning each other that there is an "*Ochisia*" in the path.

12.

No. 537. *Auchmeromyia luteola* Fabr. (Dipt.)

This fly (the larva of which has been somewhat unfortunately designated as the "Congo" Floor Maggot) is an important human ectoparasite, widespread in Africa, living entirely in its larval state, so far as is known, on human blood.

I have already published in these columns * an account of its life history and shall not repeat my observations here.

13.

No. 449. *Chrysobothris fatalis* Har. (Coleopt.)

This Buprestid together with others of the same family, *e. g.*, *Sternocera feldspathica* Whit., *Steraspis amplipennis* Fabr., *Psiloptera wellmani* Kerr., etc., deserve place in this list from the fact of the wood boring habits of their larvæ; but my notes on these are not yet complete and I include the species because it (with the other three handsome species mentioned) is a common article of food among the native blacks, who also eat other beetles, notably *Zographus ferox* Har. and the larvæ of a species of *Camenta*.

14.

No. 547. *Anthomyia desjardensii* Macq. (Dipt.)

I have reported a severe case of intestinal myasis caused by this fly.† Thirty larvæ were passed by the patient, some of which were bred out and proved to be the species above mentioned. The fly, first described from the Isle of France, had not previously been convicted of causing myasis in man.

15.

No. 1025. *Dacnodes wellmani* Burr. (Dermatopt.)

This giant tropical earwig which has proved to represent a new genus and species was first brought to my attention by the fact that the blacks fear it and scramble out of its way in the same manner that they avoid scorpions, centipedes, etc. They state that the creature "bites" and is very poisonous, giving instances of serious effects from its venom. It is an interesting fact that another large earwig (*Anisolabus colossea* Dohrn) found in New South Wales is feared in the same manner by the inhabitants. I have never personally seen any one bitten by *D. wellmani*, but it is very possible that it may introduce septic matter by a bite from its powerful forceps somewhat as a species of *Mutilla* common in Cyprus (locally called "Sphalangi") is thought to convey anthrax bacilli by its sting.

---

* Observations on the [illegible] Entom. News, [illegible]

† [illegible] Myasis Accompanied by Severe Abdominal Pain, etc. American Journal of the Medical Sciences, May [illegible]

16.

No. 168. *Polyrhachis militaris cupreobubescens* For. (Hymenopt.)

This ant (which is the local representative of *P. militaris* Fabr.) is to my mind the most interesting of all Angolan insects. The habits of the Driver Ant (*Annoma arcens* Westw.) have elicited much admiration, but those of the less known species under discussion are even more wonderful. These ants are a mighty friend to mankind in that they feed on termites. I once spent an hour or so watching them raid a nest of these insects. The termites were swarming, the ground about their nest being almost covered with workers and soldiers, and the winged adults were rising in great numbers. The orderly and steady advance of the ants, which were about 450 in number, was in marked contrast to the oftentimes somewhat erratic movements of *A. arcens*. On reaching the termites the ants broke order and killed the workers by crushing each one in their mandibles. The more formidable soldiers and large winged adults were seized and stung to death. Then each ant loaded its mandibles with as many termites as it could crowd into them, using both legs and tip of abdomen in the process, and the whole column filed off to their nest, the entire movement being executed with a precision and expedition that can only be compared to the manouvers of a trained body of soldiers. As the ant nests are innumerable and their raids take place often, they greatly lessen the number of destructive termites in the colony. They are rather vicious creatures, being armed with a powerful sting, the effects of which are fully as severe as those of the larger wasps. I have been stung while digging out their nests for larvæ and pupæ, and to obtain specimens of Paussidæ. The sting causes swelling, burning, itching and does not entirely disappear for a fortnight. When disturbed the ants stridulate with an angry buzzing sound almost exactly like that of water boiling in a small vessel.

(To be concluded)

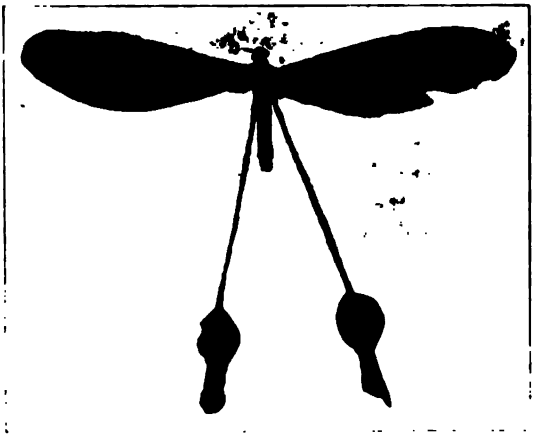
ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JANUARY, 1908.

We have selected a fossil species as the most remarkable insect made known during the preceding year. *Halter americana* was described by Prof. T. D. A. Cockerell in Science, N. S., vol. XXVI, No. 666, p. 446, October 4, 1907. We quote from the original article as follows: A wonderfully preserved example with wings spread, from the Miocene shales of Florissant, Colorado. The anterior wings are clear hyaline, with venation as usual in the genus; hind wings as in all the Nemopteridae, to which family it belongs. The Nemopteridae are to day confined to the Old World, except a single species found in Chile This species belongs to the section of the genus containing the Persian *Halter extensa* Oliv.



It has been suggested to the NEWS that there should be a journal devoted to personal recriminations. Such a publication could be issued once or twice a year and the expense of the publication should be defrayed by the authors of the articles appearing in it. There should be no editing of any article except in so far as necessary to allow the publication to go through the United States mails. Personalities should not appear in self-respecting journals, as they do not advance science in any way, and the persons indulging in them only hold themselves up to ridicule and scorn. It is very unpleasant to reply to such articles and individuals should rise superior to the imputation that the failure to reply means acknowledgment of the position taken by the other party.

Moreover, the scientific world is not interested in disputes, as science is only advanced by the general acceptance of facts. On the other hand differences of opinion expressed in appropriate language should never cause offense. In a formative study different views are very likely to be held and should cause no friction.

Entomological Literature.

FURTHER RESEARCHES ON NORTH AMERICAN ACRIDIIDAE.—By Albert Pitts Morse. Carnegie Institution Publication, No. 68, 1907. 54 pp., 1 map, 9 pls. and frontispiece.

This extremely interesting publication is a report on the data obtained during a field trip made in the summer of 1905 under the auspices of the Carnegie Institution of Washington. On a previous trip, the results of which have been reviewed in these pages,* the author carried his field investigations through a large portion of the southeastern United States, and on the expedition of 1905 it was planned to make a reconnaissance of Tennessee, Alabama, Mississippi, Louisiana and Arkansas. However, the presence of yellow fever in Louisiana and the accompanying quarantines necessitated a re-arrangement of the work, and in consequence Indian Territory, Oklahoma and northern and "Pan-handle" Texas were examined instead of Louisiana. In all fifty-two localities were visited, of which Cheaha Mountain, Alabama, Magazine Mountain and Rich Mountain, Arkansas and Mount Sheridan, Oklahoma, may be particularly mentioned. The boreal element noted on several of these mountains, while meagre, is still sufficient to make the regions of considerable interest.

---

* ENTOM. NEWS, xvi, pp. 22-23.

After a general summary of the field work completed, the paper is divided into the following sections: Life Zones of Region Examined (p. 7); Humid and Arid Faunas, Dispersal, Brachypterism (pp. 7-8); Locust Coloration (pp. 8-11); Notes on Coloration and Variation (pp. 11-12); Habits, Habitats and Local Lists (pp. 13-22); Extension of Known Range (p. 23); List of New Species and Varieties Secured (p. 23); Localities at which collecting was done (pp. 23-24); Annotated List of Species (pp. 24-54).

Under "Humid and Arid Faunas" the opinion is expressed that "the transition from humid to arid conditions and fauna is gradual rather than abrupt, the borderland of the two in Texas, Indian Territory and Oklahoma being peopled by numerous genera and species of very wide....distribution, and also by some of more limited range restricted to the district between the Mississippi River and the Rocky Mountains, but occurring both in the humid and arid sections of this region." Under "Brachypterism," the author states that aside from the Tettiginæ "every flightless species of locust known from the eastern half of the continent is phytophilous, as distinguished from geophilous, in habits. This statement is in accord with the author's previously expressed view on brachypterism, but it appears to the reviewer that exception can be taken to this statement in several instances, the most striking of which are the most decidedly brachypterous and consequently flightless *Aptenopedes sphenarioides* and *Radinotatum brevipenne*, both species being at all events as terrestrial as *Spharagemon bolli*, which is considered (p. 37) a sylvan geophile.

Under "Locust Coloration" (pp. 9-10), the author gives us a much simpler and more logical argument than that presented by Vosseler to account for the brilliant coloration of the wings of certain Acridiidæ. The display of the wing color is considered to be a method of "signaling, of attracting attention and thereby effecting or maintaining communication between the sexes or the individuals of a community." Under variation notes (p. 12), it is of particular interest to note that the material collected by Prof. Morse demonstrates the necessity of considering four nominal species of *Trachyrhachis* (*Mestobregma* of authors) as mere geographic races of a widely spread species. From a type with a broad fuscous band on the wing and a lemon yellow disk to the same (*thomasi*), two intermediate forms (*fuscifrons* and *obliterata*) carry the gradation to a type with the wing band entirely lacking and the disk hyaline (*kiowa*). This variation is correlated with climatic conditions, the strongly colored type inhabiting the more humid regions, the hyaline type frequenting the more arid sections, the intermediates occupying intermediate areas.

The new species and varieties taken on the 1905 expedition were [illegible] *denticulatus*, *Hippiscus immaculatus*, *Podisma australis*, *Melanoplus latens*, *M. tuberculatus*, *M. tribuloides*, *M* *tepidus* and *M. scudderi latus*. In all, one hundred and twenty-four species were secured.

In examining the "Annotated List of Species," a few records and statements call for some remarks. The record of *Telmatettix aztecus* Saussure from Mt. Sheridan, Oklahoma, is of considerable interest, as are also that of *Orphulella speciosa* from Cheaha Mountain, Alabama and *Chloëaltis conspersa* from Magazine Mountain, Arkansas. The information on *Boöpedon auriventris* is of interest, while the data on the very local and distinctly saxicolous *Trimerotropis saxatilis* are very complete, demonstrating how protective coloration is apparently a strong factor in the life of this species.

Under notes on various species of *Schistocerca* (pp. 42-44) the author recedes somewhat from his former position on the synonymy of *S. alutacea* and *rubiginosa*, admitting that in the south and west "the structural gap between the two seems to be bridged." The record of a species of *Podisma* from Cheaha Mountain, Alabama, and *Melanoplus fasciatus* from the same locality are of particular interest, while the remarks under *Melanoplus keeleri* regarding the possible synonymy of *keeleri*, *luridus* and *deletor* are noteworthy when taken with the synonymy of *deletor* and *keeleri* recently established by another author. We have to thank Prof. Morse for giving us an extremely important work which, with his previous one along the same lines, is absolutely indispensable to the student of insect bionomics as well as the working Orthopterist.—J. A. G. R.

MOSQUITO LIFE.—BY EVELYN GROESBEECK MITCHELL. J. P. PUTNAM'S SONS, NEW YORK AND LONDON. The Knickerbocker Press. 1907. XXII, 1-281 pp., front., illus., plates.

In this book Miss Mitchell has given the public, more especially of America, a digest of the voluminous contributions that have been made to this subject up to the present time, and in addition, some original observations and conclusions of her own that have never before been published.

The text is clear and covers all phases of the subject that are and are likely to continue to be of interest to people in general. Moreover, the numerous illustrations are destined to make clear all points that might have remained doubtful without this assistance. To indicate the scope of the work, we cite the titles of the different chapters : I. Systematic Position and Structure. II. Some Habits of the Adults. Herein the types of habits of everyday interest are fully brought before the reader and explained. III. How Far Mosquitos Fly. This momentous subject is properly given a separate chapter and here the important species are considered in regard to a phenomenon, the knowledge of which is so exceedingly useful in that it dictates what shall be the extent of extermination for the relief of a given area wherein the prevalent species of mosquitos are known. V. Larvae and Pupae. VI. Malaria. VII. Yellow

Fever and Other Diseases. In this and the preceding chapter good accounts are given of the interrelations between man, some of the lowest forms of animal life and mosquitos; also the status of yellow fever in regard to these insects. VIII. Mosquito Remedies and Enemies. Embodying the details of the most practical means toward the mitigation of the scourge and pest. IX. Notes on the Commoner Species. Wherein are set forth the cardinal features of the carriers of disease, the pestiferous forms and a few of the seemingly harmless, yet interesting species. X. Collecting and Laboratory Methods. XI. Identification Keys and Systematic List. These, the last and the next to the last, chapters have in them information of great importance in the first stage of any campaign against mosquitos. Especially worthy of note are the keys whereby the larvae may be positively determined. The key to larvae makes the book exceptionally valuable to the inspector who, in the course of his survey, cannot take time to breed out the species which he meets in the pursuit of his object—*i. e.*, the blazing the way for the practical exterminator or the health officer and the contractor. Finally, there is a bibliography which, to those sufficiently interested, opens all channels leading to the vast library on mosquitoes; an appendix entitled Mosquitoes and Leprosy, in which is reviewed the speculation on the supposed relation between these two, and a full and convenient index to the entire book.

The latest generic combinations of the species is given, also most of the synonyms—we regret in this connection to have to note the abscence of one of the synonyms of *Anopheles maculipennis*, namely *claviger*, which is current even at this late date among American doctors of medicine, in witness whereof we cite: "Plain Labels on Germ Enemies," by W. H. Thompson, M. D., LL. D. Everybody's Magazine, page 692, 1907.

All in all, this volume is a most useful one—one that will supply a very evident want. It should be widely heralded so that it may reach every intelligent person. Entomologists, doctors, health officers and, in fact, all who are interested in public welfare, can't afford to be without this latest guide, which indeed deserves to be inscribed as it is—"In Memory of James William Dupree, M. D. The true citizen, the beloved physician, the constant investigator."—H. L. VIERECK.

ON THE W. HORN-ROESCHKE SCHOOL.

In the Annals of the Hungarian National Museum, there has lately appeared a monograph of the Cychrini, by Dr. Hans Roeschke, purporting to include all the described species. The subject is treated on the lines of the W. Horn-Roeschke school of entomological philosophers, with its ponderous system of species, subspecies, varieties, aberrations and monstrosities, although the divine inspiration by which they are enabled to determine the status of these various subordinate forms belongs only to themselves. It appears to me that ordinary common sense would dictate but two subdivisions of the species, as demonstrable by material at hand in our collections, the subspecies and the mutant or sport, the former including the subspecies and variety of the W. Horn-Roeschke school and the latter term comprising the so-called aberration and monstrosity, the distinction between which is surely academic. The determination of any particular form as a mutant is generally a pure guess, but this single conjecture is preferable to the two or three guesses of the school under consideration.

We may proceed at once to the discussion of several points of more or less general interest suggested by this work on the Cychrini, one of which refers to the right of a reviewer to reëstablish a specific type, the original being lost, as in the case of *Brennus ovalis* Mots. In my monograph of the genus *Brennus*, I established a new type for *ovalis*, corresponding completely with the original description and figure of Motschulsky and felicitated myself upon a happy discovery, but this fact is wholly disregarded by Roeschke, who states that *ovalis* is something else. This is a matter of principle, to be associated with the priority principle and others equally vital to the permanence of our nomenclatorial system, and I bring it forward now to test its reality among serious investigators. *Ovalis*, as I established it, is a species allied to *ventricosus*, having two anal setae in the female and is not one of the allies of *punctatostriatus*, of which *alternatus* Mots., is a synonym, the type of the latter also being lost. I believe it can correctly be maintained that the only authentic type of *Brennus ovalis* Mots., now forms part of my collection.

A certain apparent animus on the part of the author of the Cychrini monograph has led him not only into many errors of identification, but uniformly induced him to refuse me the benefit of the doubt where absolute knowledge was lacking; this is particularly evident on p. 181, where he accuses me of making three species on identical material, based upon purely individual differences. I can assure him that he is mistaken, not only as to the material being collected in anywhere near the same locality, but in the taxonomic value of the three forms, which might be considered subspecies of a single species, if one so desires, but could in no possible way be held to be synonyms by any careful investigator.[*] And this leads me to the most serious defect in the methods of this new W. Horn-Roeschke school, in failing to recognize the forms due to geographic isolation, by which most species have undoubtedly arisen, for it is chiefly by the study of these subspecific or incipiently specific forms that our knowledge of evolution may be substantially advanced, and their complete effacement in a taxonomic system as meaningless synonyms, is a retrograde movement that cannot live. In other words, this school aims to enhance the importance of a species, frequently to subgeneric rank, and to blot out, as far as possible, all intermediate forms. These local forms ought to be designated by name in order to admit of ready reference. I generally describe them as species, because the time is not yet ripe to assign them their true places, though the differential characters employed will generally indicate their relationships, but whether they are called species or subspecies, according to the idiosyncracies of various systematists, is wholly immaterial to me; to lump them as synonyms into a composite species with all manner of divergent modifications, which are permanent and recognizable in the several local forms, is, however, by no means calculated to increase the sum of knowledge or to afford useful data for etiologic investigation. Greater care and exercise of more perceptive discrimination in studying the forms of animal life is, with this exaggerated valuation of the species, forcing us into trinomials; it will finally result in quadrinomials if the relative importance of the species does not follow downward, and we shall ultimately lose all the benefits of the binomial system. The genera of Linné are the families and orders of to day, and the species of many ultra-conservative writers of yesterday are becoming the genera and subgenera of more discriminating systematists.

---

[*] Restricting observation to the males, for purposes of comparison, *convergens*, collected only in Siskiyou Co., Cal., has the hind body very narrow and elongate, with a more biconvex and less opaque prothorax; *opacicollis*, with relatively larger, flatter and opaque prothorax, has a very stout and broadly oval hind body; it was collected only in Oregon. *Sculptipennis*, formed nearly as in *opacicollis*, has a narrower, more shining prothorax, with the sides more sinuate toward base; it has lately been received from Mr. Fuchs, collected at Upper Soda Springs, Cal., which was probably the locality of the original Levette specimens.

I am rather of the opinion, after preliminary study, that the method of subdivision for the various groups of *Brennus*, proposed by Dr. Roeschke, is more satisfactory and somewhat more practical than that of Dr G. H. Horn, which I adopted in my revision, but when the author assumes that each one of these semi-subgeneric groups represents but a single species, with an attendant retinue of subspecies, varieties, aberrations, anomalies and monstrosities, he adopts certainly a very extreme view of specific weight and, moreover, one that is very complex and confusing. The *marginatus* group alone contains some eight or nine clearly marked, true breeding, constant and easily recognizable forms, which, according to usual custom, ought to be considered species, or some of them possibly subspecies, and the assumption, on the part of the author, that he can conclusively assign these various forms to the numerous subordinate categories adopted by the school under discussion, bespeaks a degree of self-confidence which is truly astounding. Besides, he does not make enough groups, [illegible], for example, not being assignable to any one of those defined by him, having the facies and general structure of [illegible] with a single anal seta in the female and wholly isolated in some features, as in the greatly elevated thoracic margin.

The work of Roeschke on the Cychrids is a perfect replica, in method and nomenclature, of the recent papers by Dr. W. Horn on the Cicindelidae and the defects of the latter author in his mode of reasoning are fully as patent as those of the former, for one who could unite *Omus* mon-

lanus with *edwardsi* as a mere synonym, must have the sense of intellectual perception very feebly developed ; such a course could only be confusing to future reviewers and of no possible service to science, which is supposed to be an orderly and systematic statement of fact. This lapse of scientific acumen is in every way similar to that of Roeschke in suppressing the splendidly distinct *Brennus insularis* as a synonym of *marginatus*, the reduction of *symmetricus* to the status of an "aberration," whatever that may mean, the identification of *strictus* with *latipennis* Mots., the suppressing of *basalis* as a mere subspecies of *cristatus* and *Cychrus pustulosus* as a synonym of *tuberculatus*, and in reaching many other equally false conclusions, which can only serve to still more hopelessly befog the subject of specific identity in this rather difficult group of beetles.

While engaged in polemics, it may be worth while to draw attention to a recent article by Dr. J. Weise, in which he emits the opinion that I did not intend to write *Macronæmia*—a genus of Coccinellidae—but meant *Micronæmia*, and proceeds to change it forthwith, describing a new species under the name so altered. The Greek word μακρὸς, in its essential and fundamental meaning, conveys the idea of linear extension, either in space or time, and not of expansion in all directions like μέγας. In the Latin it becomes *macer*, and in English *emaciated*. In naming the genus *Macronæmia*, I intended to convey the meaning of extension, that is : it is a slender and relatively elongate *Næmia*, without reference to its size. In taking it for granted that *Macronæmia* must be a mistake and in substituting *Micronæmia* for it, Dr. Weise has merely increased the burden of synonymy, for *Micronæmia* Weise, must be a synonym of *Macronæmia* Csy. By the soundest rules it could not have been altered anyway, even though erroneous or a misprint.—THOS. L. CASEY.

ON THE BIOLOGIES OF THE RHYNCHOPHORA OF NORTH AMERICA. BY W. DWIGHT PIERCE.—studies from the Zoological Laboratory of the University of Nebraska. Pp. 249-320, No. 78.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

EVE hung her wash out to dry and a caterpillar ate it.

Going to the dogs, at any rate, is no indication of degeneracy among fleas.

CHANGE OF ADDRESS.—W. E. Hinds, Professor of Entomology and Entomologist to the Experiment Station, Alabama Polytechnic Institute, from Dallas, Texas, to Auburn, Alabama.

MR. HENRY L. VIERECK, of Philadelphia, has been appointed Chief Clerk of the Division of Economic Zoology of the Department of Agriculture of the State of Pennsylvania at Harrisburg.

A REQUEST for information has been sent to the U. S. Department of Agriculture for an expert opinion as to whether it is possible for entomologists to contract osteoporosis. It is feared that the disease has affected some individuals.

"Now, children," said the teacher, "see who can make up a 'story' containing the words 'boys,' '*bees*,' and 'bears.'" The freckled boy's hand was up at once. "Well, Michael." And Michael responded: "Boys bees bare whin they goes in swimmin'."

THE undersigned will be glad to determine Oryssidæ, Siricidæ, Cephidæ and Evaniidæ (except Gasteruptionidæ) from North America or other countries, aud will especially welcome and give credit for records of capture and distributional data in these families.—J. CHESTER BRADLEY, Cornell Univ., Ithaca, N. Y.

PREOCCUPIED NAMES OF PAN-AMERICAN ANDRENA (HYMENOPTERA).—*Andrena* (*Parandrena*) *andrenoides* var *bicolor* Rob. not *bicolor* Fabr.
= *A.* (*P.*) *a.* var. *clarigastra* n. n.
Andrena salicis Rob. not Verhoff = *bisalicis* n. n.
Andrena della Vier. not Kby. *didella* n. n.
Andrena indolata Vier. not *Andrena* (*Trachandrena*) *indolata* Vier = *perindolata* n. n.—H. L. VIERECK.

PROFESSOR KOCH has ascertained that there is a distinct connection between crocodiles and sleeping sickness caused by trypanosomæ. Wherever crocodiles are found the disease may be discovered, but only in places near the banks. The blood of crocodiles forms the chief nourishment of the *Glossina palpalis*, which sucks the blood between the plates of the animal's hide. The extermination of the *Glossina* is impossible, but the same end may be reached by destroying the crocodiles or by the removal of the bushes and undergrowth where the animals lurk.

AN ADDITION TO THE NEW JERSEY LIST OF BUTTERFLIES.—In July, 1900, while at Brookville, Ocean Co., N. J., I captured two (♀) Pamphilas that were new to me, and on the 30th of July another was taken at Lakehurst. The females in this species show much variation in regard to the proportion of fuscus and tawny color on the upper side. These butterflies have been shown to Dr. Skinner, who has derermined them as *Pamphila arogos* Bd. and Lec., and considers the capture of this insect in New Jersey of much interest, for heretofore it has been considered a southern and southwestern species. He adds that it only goes to prove the saying that "one can find any species in New Jersey."

I may also mention that *Pamphila aaroni* Skinner was not uncommon this past Summer at Tuckerton, N. J., and I discovered a number skipping about on the flowers growing in that always interesting zone where the upland meets the salt meadow.—WM. T. DAVIS.

TERIAS MEXICANA BDV. IN NORTHERN COLORADO.—While mounting some Lepidoptera collected by Mr. G. M. Hite and myself in the northern part of Boulder County, Colorado, I came across three specimens of *Terias mexicana* Bdv. They were collected by Mr. Hite in Copeland Park, on the North St. Vrain Creek, September 6, 1907. Copeland Park is in the lower part of the Hudsonian Life Zone, and has the altitude of about 10,300 feet.

The specimens agree in every detail with the figure of this species in Wright's Butterflies of the West Coast, except that the secondaries in one specimen are a trifle yellower. They are all males. The wings are somewhat broken on the outer margin as if they had flown a long distance.

Mr. W. G. Wright (Butterflies of the West Coast) says that, as far as he knows, *T. mexicana* has been found no place north of the Mexican border except in Arizona. Dr. Holland (Butterfly Book) says it is common in Arizona and very abundant in Mexico. Dr. H. G. Dyar (Bul. 52, U. S. Nat. Mus.), gives it from the Mississippi Valley and Mexico. Dr. Skinner (Cat. N. Am. Rhopalocera)* gives it from Mexico, and Mississippi and Colorado occasionally. Prof. T. D. A. Cockerell says it is somewhat common in New Mexico and that he has seen it at high altitudes. These localities have been given for New Mexico, Water Cañon (Snow), Mesilla Valley (Ckll.), La Cueva (Townsend), Pecos (Ckll.), and top of Las Vegas Range, 11,000 feet. (Ckll. Psyche, Nov., 1901, p. 272). Prof. D. T. A. Cockerell made this note in the Univ. of Colo. Card Catalogue: "*Terias mexicana* Bdv. (1836). This is not in Gillette's Colo. list, but I saw a light yellow *Terias* in Boulder Cañon, 7,340 feet, September 22, 1907. It could not have been anything else." From these two records from Boulder Co., in 1907, we may assume that a goodly number of this species migrated northward along the eastern foothill region of the Rocky Mts., or that they have come westward from the Mississippi Valley. To me the first seem more probable. At any rate the finding of this Sonoran butterfly in boreal, northern Colorado is a matter of no little interest.—S. A. ROHMER, Boulder, Colo.

THECLA LOKI, SKINNER.—This new species was discovered by me and a party of enthusiastic collectors July 5th, 1906, on the road between Jacumba and Mountain Springs, about 80 miles east of San Diego. The country about is practically a desert. The vegetation is composed of the common greasewood and cactus, with a little bunch of grass scattered about. There is also quite a growth of Juniper on the hills, and it is here that *loki* is to be found. He is a shy bird and keeps well to the tops of the bushes; he is swift of flight, too, and owing to the similarity of his color to that of the Juniper, correspondingly hard to take. At the time we were there it was probably late, as we only succeeded in taking one perfect specimen, which I was selfish enough to keep for my own collection. Although it seemed to be quite plentiful in this locality, I am of the opinion that it is a Mexican butterfly, and that we took it on the extreme northern edge of its range; at least it was not to be taken this year in a region of the same character in every respect, and but a few miles north of the type locality, nor has it ever been seen anywhere else on the edge of the desert. The altitude at Jucumba is about 3,200 feet, and the locality where *loki* was taken is but little over a mile from the Mexican boundary.—W. S. WRIGHT, San Diego, Cal.

---

* Supplement No. 1, gives Louisiana, Mo.; Sioux Co., Neb.; New York. Also St. Louis, Mo. (McElhose and Schwarz).

Mr. Wright says, "I am not so sure that I like the name you gave it, but shall not presume to criticise. It was my intention to ask you to name it after the locality in which it was found, but it matters little so long as it has a name" I don't fancy the name very much, but I am under the impression that it is difficult to get names Linnaeus certainly had an easy time of it in respect to names and some people (see Proc Brooklyn Ent. Soc) seem to think that any names that fall short of the Linnaean standard should not be used Oh, for some one who loves to be of use to others and who will supply appropriate names! Let us have about a thousand published in the NEWS pro bono publico Happiness, by universal consent, seems to consist in doing good to others, so here is an opportunity. *Loki* was the god of strife and spirit of evil, who contrived the death of Balder Afterwards he was chained, and will continue so till the twilight of the gods The locality I had was Mountain Springs HENRY SKINNER

AN OLD RECORD OF OBSERVATIONS ON THE HABITS OF *Anabrus* —In December, 1904,* Prof Gillette published an article on the mating habits of *Anabrus simplex*, in which he described a peculiar sac-like object which is ejected by the male at the time of copulation and carried about for some time by the female. A year later Mr. Snodgrass makes the same observation on *Peranabrus scabricollis*, a related species † The ejection of this sac-like object, called "sperm sac" by Gillette, is not confined to the Decticinæ as I have seen a similar object carried by *Scudderia*

It has been supposed that these observations were new, Gillette thanking Mr Marlatt for having had a thorough search made in the library of the Bureau of Entomology for such references and stating that Mr Banks the librarian, found nothing upon the subject. Such observations had, however, been made and published almost half a century before

In an article entitled "Exploration in Upper California in 1860, under the auspices of the Smithsonian Institution," published in the report of the Smithsonian Institution for 1864, Capt John Feilner writes of what he calls the grasshopper, but which is very certainly *Anabrus simplex*. He says: "These insects were first seen by me in Pitt river valley during the Summer of 1859, and in such numbers as actually to cover the ground. * * *

---

* [illegible] XX, p[illegible] 344 pl. XIX [illegible]

† [illegible] N. Y. Ent. Soc. vol. XIII, p. 74-84, pl. I-II (1905).

The insect deposits the eggs by making perpendicular and oblique holes in the ground, to the depth of an inch, by means of its tail, which is shaped like a bayonet, and is hollow. The eggs are passed from the ovary into this tail and are dropped one by one into the holes. * * * It appears to have no particular food, but feeds upon all kinds of vegetation; it will eat the dead and crippled of its own kind, but I have never observed them destroy one another. * * * Immediately before uniting sexually, the insect without the tail (which I presume to be the male), utters a shrill whistling sound, as if to call his mate. The sexual act lasts about one or two minutes, and the peculiarity I observed at this union was, that the one I presume to be the female was over the male, instead of the reverse. After the act a small bag—evidently the ovary—is attached to the body of the female close to the tail; this is extracted from the other without the tail; after a while the bag disappears. * * *"

These observations of Capt. Feilner, who was killed by the Indians soon after making them, agree quite exactly with those of recent writers. —A. N. CAUDELL.

LIST OF ODONATA TAKEN BY DR. HENRY SKINNER, IN CARR CANYON, HUACHUCA MOUNTAINS, ARIZONA. Ten species as follows:

1. *Argia* sp.
2. *Argia* sp.
3. *Ischnura demorsa* Hagen. Taken in Arizona by Morrison, and at Tucson by Kunze, in some abundance. Both records in Biol.-Cent. Am.
4. *Erpetogomphus compositus* Hagen. Previous Arizona records are from Bright Angel (Schwarz & Barber), Phœnix (Kunze), Florence (Biederman) and by Morrison.
5. *Cordulegaster diadema* Selys. The only previous record for U. S. is Bright Angel, Ariz. (Schwarz & Barber). The species extends to Cuernavaca and Orizaba in Mexico.
6. *Oplonaeschna armata* Hagen. The only previous U. S. records are Reef (Biederman) and "Arizona" by Morrison. The species extends south to Guatemala.
7. *Pseudoleon superbus* Hagen. First record for U. S. Abundant and characteristic species for Mexico and Guatemala and Lower California.
8. *Paltothemis lineatipes* Karsch. Originally described from Brazil. There are Morrison specimens from Arizona.
9 *Pantala flavescens* Fabr. The most cosmopolitan of all dragonflies.
10. *Sympetrum corruptum* Hagen. A common species throughout western U. S. and Mexico.—BY P. P. CALVERT.

Doings of Societies.

At the meeting of the Feldman Collecting Social, held on November 20th, 1907, at the residence of Mr. H. W. Wenzel, 1523 S. Thirteenth Street, Philadelphia, there were ten members present, and Mr. John A. Grossbeck, visitor.

Professor Smith spoke about *Culex perturbans* and its habits. This is a species which for three or four years last past has been hunted by all those interested in mosquito work; but not until this year were the habits of the larva ascertained. The first stages of the larva had become known from eggs obtained from gravid females; but what became of them after they got out of the eggs nobody knew.

Briefly stated, the eggs are laid in a raft on the surface of the water in densely overgrown swamps, illustrations of which were shown. The young larvæ hatching from these eggs at once make their way through the water to the mud surface and through the mud surface among the root mass below. Among these roots, anywhere from 2 to 4 inches below the bottom, the larvæ attach themselves by their anal tube and remain concealed from all ordinary natural enemies and in territory where no other mosquito larvæ can breed. The air supply seems to be obtained chiefly through the vascular system of the plants which is very loose and open.

Mr. Grossbeck, in supplement, explained how he had found the breeding places by hunting egg boats, of which he finally found large numbers, at Lahaway, in Ocean County, and at Trenton, in Mercer County. He further described the particular character of the plants among which the larvæ are found and told how he collected them by forcing the net below the grass tussocks and, by disturbing the larvæ attached to the roots, got them into the free water, where he could get them with the net.

Mr Kaeber exhibited several species of Coleoptera and Lepidoptera, which he collected in Arizona in the past summer, which showed remarkable mimicry, and stated that the beetles and moths were taken at the same places and time, and in some cases were beaten from the same trees.

FRANK HAIMBACH, *Secretary*.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted, by purchase or exchange, Bibliog. Amer. Econ. Ent., Part 4, in good condition.—E. A. Klages, 82 Belvidere Street, Crafton, Pa.

I am desirous of acquiring by purchase or otherwise the rarer species of North American as well as exotic Endomychidae, also all literature (particularly papers by Crotch, Horn, LeConte, etc.) relating to the family not in my possession.—L. B. Walton, Kenyon College, Gambier, Ohio.

Wanted—Cocoons and pupae for cash or in exchange.—American Entomological Co., 55 Stuyvesant Ave., Brooklyn, N. Y.

I am desirous to send interesting "Lamellicornia" from Ecuador. I would like identified species in exchange.—Prof. Francisco Campos R., Guayaquil, Ecuador (Apartado No. 484).

Wanted to Exchange—Missouri butterflies with collectors in the north, east, south and west.—Aug. Knetzger, 3822 McDonald Avenue, St. Louis, Mo.

I will exchange a fine selection of Missouri *Catocala* for others, from other States.—Ernst Schwarz, 6310 Newstead Ave., St. Louis, Mo.

I have *P. modesta*, *H. chersis*, *H. luscitiosa*, *P. achemon*, *A. bicolor*, *A. angelica*. *At. jorulla* pupae to exchange for *P. pandorus*. *Dar. versicolor*, *Cal. astylus* and other North American pupae.—V. Musil, 1118 So. Trumbull Ave., Chicago, Ill.

Lepidoptera.—I have for exchange bred specimens of *Papaipema nitela*, *nebris*, *frigida*. *imperturbata*, *cataphracta*, *impecuniosa*, *marginidens*, *Nonagria*. *oblonga* and *Achatodes zaea*. Would like specimens of same genera.—F. E. Moeser, 238 Guilford St., Buffalo, N. Y.

I have one copy of Baron de Rothschild and K. Jordan's "Classification of Sphingidae" (part 57, Genera Insectorum), with beautiful plates. Will exchange same for North American moths.—G. Chagnon, P. O. Box 186, Montreal, Can.

I have for exchange Chrysalids of *Regalis imperialis*, *hylaeus*, *modesta*, *ajax*, *troilus*, *cresphontes*, *andria* and eggs of *Catocala piatrix*, *vidua* and perhaps others. Wish *Catocala* eggs and imagoes.—R. R. Rowley, Louisiana, Mo.

Wanted *Pachybrachys*.—I am trying to unsnarl the species of this genus and need much larger series than I now have. I will buy specimens from any part of North America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline, Mass.

Wanted for cash or exchange.—Large and showy North American insects of *all orders*, beneficial and noxious insects, specimens illustrating life histories.—Write to Dept. Natural Science, The Kny-Scheerer Co., 225-233 Fourth Ave., New York.

Lepidoptera for exchange. Would like Californian species not in my collection.—Erval J. Newcomer, Palo Alto, Cal.

Lepidoptera.—Pinned, in papers, complete data, in perfect condition for exchange. Would prefer to exchange for living pupae.—J. Russell, Digby, Nova Scotia.

Wanted for cash or exchange.—Bull. U. S. Div. of Ento. (old series), Nos. 1, 5, 8, 9, 10, 26, 23. J. A. Lintner's New Jersey Reports, Nos. 3-13, Illinois Reports, Nos. 14-20, Missouri Reports, Nos. 7-9.—E. F. Hitchings, Waterville, Maine.

Lepidoptera for Exchange.—*Catacola badia, antinympha, praeclara*, pupae of *luna, io, imperialis, cecropia* and *polyphemus*.—Jacob Dueiks, Box 317, Stonington, Conn.

Luna Cocoons.—I have a number of living *luna* pupae of other North American Lepidoptera or papered Lepidoptera new to my collection.—B. R. Bales, M. D., Circleville, Ohio.

I have pupae of *Lapara coniferarum* and *Cith. regalis* to exchange for *Theclas, Lycaenas* and *Chrysophanus* not in my collection.—H. H. Brehme, 74 13th Ave., Newark, N. J.

I have pupae of *Papilio turnus* and *cresphontes, Sphinx luscitiosa, chersis, Ampelophaga myron, Triptogon modesta, Paonias myops, Smerinthus geminatus, Ceratomia undulosa* and *P. quinquemaculata*. Want other pupae in exchange.—John Kythca, 1347 So. Scoville Ave., Oak Park, Illinois.

Geometridae wanted, named or unnamed, particularly from the Northwest, Arizona, Montana, Idaho, North Carolina, Texas and Florida. Write first giving quantity and price. Will buy or exchange. Wm. H. Broadwell, 2[illegible]9 Plane St., Newark, N. J.

Would like to exchange 80 named species, many specimens of European Coleoptera (many nice sp. Carabus, Calosoma, etc.), for 50 named sp. of Coleoptera from western states.—C. Harnach, 527 W. 16th Street, Chicago, Ill.

A few pairs of that interesting beetle *Ignotus aenigmaticus* Slosson for any of the following Cremastochilus 5913, 5915, 5916, 5917, 5918, 5919, 5921, 5924, 5928.—L. H. Joutel, 164 E. 117th St., New York, N. Y.

Cocoons of *T. Polyphemus* and *Samia promethea* to exchange for *Samia cynthia, Attacus orizaba* or others.—J. J. Henneberger, 1011½ Ewing Ave., Chicago, Ill.

Wanted. North American Diurnals, Sphingidae and Catocalae. Offer in exchange large variety of European Lepidoptera.—J. McDunnough, Berlin, W. 30, Motzstr. 6, Germany.

Wanted. Named or unnamed Elateridae and Buprestidae from all parts of North America. Will give named Coleoptera in exchange.—C. O. Houghton, Delaware College, Newark, Delaware.

I wish to exchange Chrysalids of *P. imperialis, P. ajax, troilus, turnus, P. hylaeus* and many others for exotic material. G. H. Hosen[illegible] [illegible] Salena St., St. Louis, Mo.

Pupae of *Papilio ajax and troilus* for exchange, also a few specimens of *[illegible], Pima and Stella*, from Arizona. Imagos.—S. Weil, Calhoun, Ky.

Lepidoptera for exchange from 1907 with data and identified. Also chrysalids of *P. turnus, cresphontes* and *troilus*. F. Walkmus, 4108½ [illegible] St., St. Louis, Mo.

Will collect in any order and supply European material in exchange for Lepidoptera, especially cocoons and pupae.—J. W. H. Harrison, 181 [illegible] Rd., Middlesbrough, England.

PUPÆ OF LAPARA CONIFERARUM and CITHERONIA REGALIS FOR SALE. H. H. BREHME, 74 13th Ave., Newark, N. J.

1,000 PIN-LABELS, TWENTY CENTS!

[illegible]

C. V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

FOR SALE

The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, .25;
C. arizonensis, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. hornii*, .50; *Pasi-*
machus mexicanus, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. arizo-*
nicus, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Monilema gigas*, .40; *Oncideres*
tessellatus, .75; *Leptostylus yuccæ*, 50.; *Urodera crucifera*, 20; *Nodonota arizonica*, .25.
Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus epigona*, .50;
Oxycnemis adrena, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia alata*,
.40; *Spragueia plumbifimbriatus*, 25; *Hatima zethus*, .75; *Triprocris rata*, .30; *Gingla later-*
cula, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North
American insects of all orders for sale, or exchange furnished on application.

F. H. SNOW - - - **LAWRENCE, KANSAS**

---

he Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

scribed in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,
6, Gunterstone Road, West Kensington, London, W.

Cat. No. 17 for 1908 (now ready) mailed free on demand.

e only dealers' list giving authors' names throughout. 100 named speci-
qual: ex Assam, 40 different species in papers, including *Papilio boo-*
s, etc., mailed free on receipt of Post Office Order $4.00 Explanatory
ue, with over 300 descriptions and many interesting notes 12 cents.

PARCELS SENT ON APPROVAL FOR SELECTION.

NG COCOONS AND CHRYSALIDS

o zolicaon 20c., ajax 12½c., turnus 10c., troilus 10c., philenor 12½c.,
c.; Eudamus tityrus 5c.; Hemaris thysbe 12c.; Sphinx kalmiae 50c.,
40c., chersis 50c., plebeia 25c., D. hylaeus 20c,, Cer. undulosa 15c.,
modesta 50c.; P. excaecatus 15c.; Eudryas unio 5c.; Euch. egle 5c.;
rceti 8c.; Apatelodes torrefacta 5c.; Dat. ministra 5c.; S. cynthia 2c.;
ea 3c., angulifera 50c., cecropia 3 , luna 20c,, polyphemus 7c.; Ant.
nperialis 12c.; Cith. regalis 60.; Anis. stigma 8c., senatoria 7c., vir-
; D. rubicunda 10c. Reduction if taken in numbers.

tens in perfect condition expanded.—Morpho cypris $1.00 to $1.50; sulkowskyi
odarti, a large opal morpho, ♂, $3.00 to $6.00; ♀, $5.00; amathonte $1.00 to $1.50.
g to size and beauty.

ULDA, 816 Broadway, New York

The Butterflies of the West Coast

A new book. Text, descriptive and critical, of all known species, illustrated ith thirty-two full page plates in best modern photographic color work, with early a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practically ut of print; is not in any dealers' stock, and only a few copies now remain in he author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

OLORED PLATES of the BUTTERFLIES of the WEST COAST

An abridgement of the above, consisting of the full set of plates as issued in hat book, with names of all species printed on pages facing the plates, but ith no descriptive text; issued as the best possible substitute for that more xpensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book ddress the author.

. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

FOR SALE

eports N. Y. State Entomologist; Nos. 1 to 14 inclusive (Nos. 1 to 12 are Lintners); 13 and 14 are Felt's). Sold together for $10.

eports Ills. State Entomologist: Nos. 4 and 5 (LeBaron), $1.50; 6, 7, 8 and 9 (Thomas), $3.00; 16 to 22 inclusive (Forbes), $5. Sold separately as grouped and priced, or the whole lot for $8.50. Address

VERNON L. KELLOGG, Stanford University, California.

SPECIAL OFFER

ifty American Sphingidae, mounted; 30 different species (inclusive **Pholus linnei, Ph. rustica, Sph. kalmiae, Mar. modesta, Prot. ochus,** etc.	$10.00
Papilio blumei, India, in paper	1.20
" " mounted, incl. box	1.50
Arctonotus lucidus, Calif., in paper, each	4.50
Lepisesia ulalumae, on pins, each	2.75
upae of **Cal. angulifera** per dozen	4.00

THE KNY-SCHEERER CO.

Dept. of Natural Science, 404 West 27th Street, New York

NOVA SCOTIAN LEPIDOPTERA.

Beautifully Mounted, in very fine condition, fully named and dated.

specimens of 200 species. Catalogue value $65.00	**$40.00**
" 100 "	**20.00**
" 100 "	**10.00**
" European Lepidoptera, on pins	**5.00**

2500 specimens, Nova Scotian, to choose from. Expressage extra.

OHN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER C

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YORK

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.
K.-S. Section Cabinets.
Schmitt Insect Boxes.
K.-S. Lepidoptera Boxes, Coleop
and Duplicate Boxes.
K.-S. Screw Handle and Amer
Nets.
The Asta Insect Pins :
White, 60c. per 1000.
Black, 70c. per 1000.

Catalogue II, Entomological Suppli
Application.

THE KNY-SCHEERER CO

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Srreet, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPOSI
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect conditio
Single specimens and collections illustrating mimicry, protective colo
dimorphism, collections of representatives of the different orders of inse
Series of specimens illustrating insect life, color variation, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect box
Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

P. C. Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

Stanford University Library
FEB
7
1908

FEBRUARY, 1908.

ENTOMOLOGICAL NEWS

Vol. XIX. No. 2.

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON. HENRY L. VIERECK. J. A. G. REHN.
PHILIP LAURENT. WILLIAM J. FOX. H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September,** in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.
Outside of the United States and Canada, $1.20.
SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NEWS, Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

FEBRURAY CLEARANCE SALE.

Owing to an overstock of Japanese Moths, the following named specimens are offered during the month of February at prices quoted below. They are in papers, and in perfect condition.

There are a number of specimens in the stock that are slightly damaged—antennae broken or slightly rubbed—which will be disposed of at **10 CENTS** each.

Send 12 cents additional with each order for packing and postage

Caligula japonica	20 cents	Brahmaea japonica	40 cents
Antheraea yama-mai	20 "	Actias artemis	50 "
Rhodia fugax	25 "		

20 specimens of Japanese Coleoptera in papers, in fair condition **$1.00**

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA.

ARIZONA INSECTS.

Will collect in most orders or families of season's catch. Also in botany, especially cactii and herpetology—reptiles and amphibians if notified early in the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th St. New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSECTS

(EXCEPT ODONATA)

OF THE UNITED STATES

BY NATHAN BANKS

Complete to Summer of 1907   Price 50 cts. (net) per copy   Mailed on receipt of

E. T. CRESSON, Treasurer,
P. O. Box 248, Philadelphia, Pa.

When Writing Please Mention "Entomological News."

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September,** in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.
Outside of the United States and Canada, $1.20.
SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NEWS, Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

FEBRURAY CLEARANCE SALE.

Owing to an overstock of Japanese Moths, the following named specimens are offered during the month of February at prices quoted below. They are in papers, and in perfect condition.

There are a number of specimens in the stock that are slightly damaged—antennae broken or slightly rubbed—which will be disposed of at **10 cents** each.

Send 12 cents additional with each order for packing and postage

Caligula japonica	20 cents	Brahmaea japonica	40 cents
Antheraea yama-mai	20 "	Actias artemis	50 "
Rhodia fugax	25 "		

20 specimens of Japanese Coleoptera in papers, in fair condition **$1.00**

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA.

ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in botany, especially cactii and herpetology—reptiles and amphibians if notified early in the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th St., New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSECTS

(EXCEPT ODONATA)

OF THE UNITED STATES

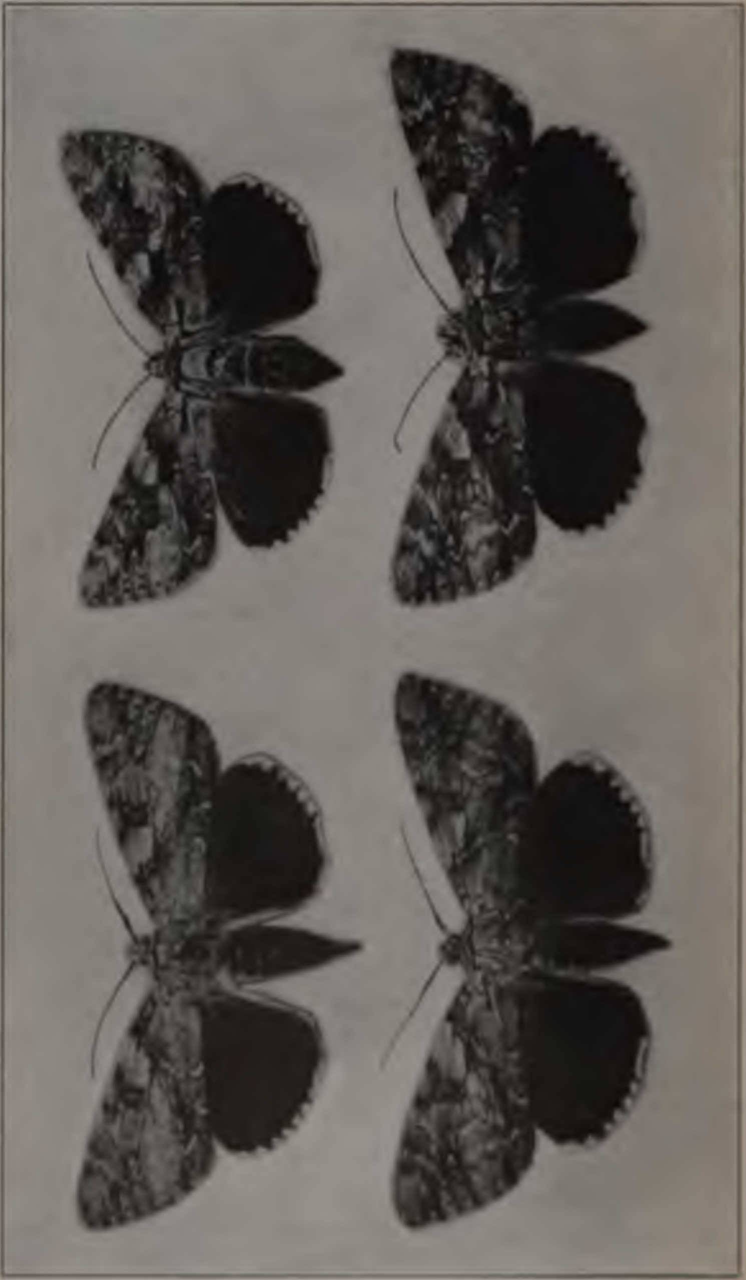
BY NATHAN BANKS

Complete in Summer of 1907 Price 50 cts. (net) per copy Mailed on receipt of price

E. T. CRESSON, Treasurer,
P. O. Box 248, Philadelphia, Pa.

When Writing Please Mention "Entomological News."

Pl. V.



CATOCALA DEJECTA STRECKER. FEMALES

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. FEBRUARY, 1908. No. 2.

CONTENTS:

Ely—Notes on C. dejecta Strecker, and other species of Catocala from East River, Conn. 47
Sherman—The Panorpidæ (Scorpion-flies) of North Carolina, with notes on the species. 50
Beutenmueller—Description of a new Catocala.......................... 54
Fenyes—A Preliminary Systematic Arrangement of the Aleocharinae (Coleoptera) of the United States and Canada 56
Wright and Coolidge—Notes on the Coleoptera of Placer Co., Calif..... 66
Wolcott—The North American species of Chariessa.................... 70
Coolidge—The North American species of the genus Erebia........... 73
Girault—Oviposition of Bibio albipennis Say 76
Biederman—A new Anisota from Arizona (Lepidoptera, Heterocera, Ceratocampidae) 77
Editorial 78
Notes and News....................... 79
Doings of Societies 84

Notes on C. dejecta Strecker, and Other Species of Catocala from East River, Conn.

BY CHAS. R. ELY, Washington, D. C.

(Plate V)

In the original description of *C. dejecta* Strecker,[*] this species is said to have no basal dash on the primaries. Hulst also, in his monograph on the genus *Catocala*, makes the absence of the basal dash one of the important characteristics separating this species from others closely allied to it.

During July and August, 1907, the writer collected thirty-one specimens of a species of *Catocala* having black secondaries. Of these, eighteen males were unmistakably *C. dejecta*, but the remaining thirteen, females, differed from the published descriptions of this species in having in every case a decided basal dash. During the period mentioned the only other black-winged forms of *Catocala* captured were *epione* and *tristis*. It is therefore evident that the thirteen females of the above series were of the same species as the males—that is, *C. dejecta*—and that therefore the literature relating to this species is incomplete in that the male only has heretofore been described, and that it is inaccurate in that the said description would exclude the female. The absence of a basal dash is, in this case at least, not a specific but a sexual characteristic.

---

[*] Bull. Brook. Ent. Soc., ii, 97, 1880; Bull. Brook. Ent. Soc., vii, 32, 1884.

In addition to the above facts it may also be stated that two females of *C. dejecta* were taken in the same locality in 1906, which have in each case a basal dash, and that a letter from Mr. Wm. Beutenmuller informs me that the only female of *C. dejecta* in the collection of the Am. Museum of Nat. Hist. also has a basal dash.

The males, in the series referred to, vary in expanse from 70 to 78 mm., with an average of 73.4 mm., with the exception of one individual which measures only 59 mm. The females vary from 66 to 79 mm. in expanse, with an average of 72.2 mm.

There is considerable variation shown by both males and females of this species. Some of the males agree quite closely with the descriptions of Strecker and of Hulst. In a number of instances there is, however, a faint indication of a tendency toward the formation of a basal dash, and in many cases there is also a slight apical shading. This apical shading Strecker states to have been absent in the three specimens which he had before him. The females are much more heavily marked with black, as a rule, than is the case with the males, and the apical shading is in many cases quite pronounced.

The most distinctive characteristic in both sexes is the very striking whitish area on the costal portion of the primaries just before the reniform. This area, which is much whiter than any other portion of the wing, extends from the t. a. line to the reniform, and is bounded below by a horizontal black shading, extending from the t. a. line to the point where the reniform and subreniform meet. This whitish patch is very conspicuous because of its contrasting black border and, together with the very dark reniform, affords an easy means of distinguishing this species from others somewhat resembling it in appearance.

The above locality yielded also a noteworthy variation of *C. gracilis* Edwards, of the form showing but little suffusion of the primaries, in which the median band of the secondaries is linear and does not reach the costal margin, on the upper side of the wing. On the under side this linear band shows even more tendency to become obsolete. It is here broken at one point and but faintly indicated at another.

Another variation from the same locality is a form which appears to be intermediate between *unijuga* and *meskei*. It resembles the latter in size and in having the median band of the secondaries end before reaching the anal margin. The coloring of the primaries is, on the other hand, exactly the same as in *unijuga*.

The complete list of species of *Catocala* taken at East River, Conn., during 1906 and 1907, is as follows:

epione Drury.
vidua Smith and Abbot.
dejecta Strecker.
retecta Grote.
flebilis Grote.
robinsonii Grote.
obscura Strecker.
residua Grote.
tristis Edwards.
relicta Walker (=*bianca* Hy. Edwards).
" " var. *phrynia* Hy. Edwards.
" " " *clara* Beutenmüller.
cara Guenée.
amatrix Hübner (=*nurus* Walker).
" " var. *selecta* Walker.
marmorata Edwards.
concumbens Walker.
unijuga Walker.
briseis Edwards.
parta Guenée.
coccinata Grote.
ultronia Hübner.
" " var. *mopsa* Hy. Edwards.
" " " *adriana* Hy. Edwards.
ilia Cramer.
" " var. *conspicua* Worthington (=*uxor* Guenée).
piatrix Grote.
neogama Smith and Abbot.
subnata Grote.
cerogama Guenée.

paleogama Guenée.
" var. *annida* Fager.
" " *phalanga* Grote.
antinympha Hübner.
badia Grote and Robinson.
habilis Grote.
basalis Grote.
pretiosa Lintner.
amasia Smith and Abbot (= *sancta* Hulst.
cordelia Hy. Edwards.
similis Edwards.
fratercula Grote and Robinson.
micronympha Guenée.
praeclara Grote and Robinson.
grynea Cramer.
gracilis Edwards.
" " var. *sordida* Grote.
" " " (linear band on secondaries).
amica Hubner (= *lineella* Grote).
" " var. *androphila* Guenée.
" " " *suffusa* Beutenmüller.
nubilis Hubner.

The Panorpidae (Scorpion-flies) of North Carolina, with Notes on the Species.

By Franklin Sherman, Jr.

Entomologist, State Department of Agriculture, Raleigh, N. C.

This group of Neuropteroid insects has received very little attention from entomologists, mainly due, no doubt, to the fact that they do not make themselves conspicuous and are of relatively little economic importance. The number of species to be found in any one locality seems to be small, though not so small as the ordinary collector might at first suppose. At Raleigh we have seven species recorded, while Mr. Manee has thus far located four at Southern Pines. Our complete list for the entire State includes fifteen species.

Our limited records to present indicate that the species are at least in the majority of cases, single-brooded, a given species occurring only at a certain season for one, two, or three consecutive months. The exceptions to this are *Panorpa ruficeps*.

P. venosa, and *P. virginica*, the data for which species indicate a possibility that they may be regularly or partially two-brooded.

The identifications are mainly on authority of Mr. Nathan Banks, to whom thanks are due. While the author has personally collected most of the species listed, a number of records have been obtained from other collectors, as shown in the text. The letters E, C, W, E-C, etc., are used to denote the geographical situation of localities, as east, west, central, east-central, etc. As a rule the more southern forms of life are found in the east and southeast parts of our State, while the more strictly northern forms are found in the west and northwest parts. Specimens are in collections of the Department of Agriculture at Raleigh, or in the collection of Mr. Banks, or collections of the other persons mentioned:

1. **Bittacus occidentis** Walk.

A fall species taken at *Raleigh* (E-C) by C. S. Brimley and G. M. Bentley. Mr. Brimley has taken it at lights. Early in September to middle of October.

2. **Bittacus pilicornis** Westw.

A spring and early-summer species taken both east and west, but not yet at Raleigh, *Havelock* (E), early in May, R. S. Woglum. *Black Mountains* (W), June, Wm. Beutenmüller.

3. **Bittacus punctiger** Westw.

Raleigh (E-C), early in June, R. S. Woglum. *Havelock* (E), late in May, 1907, F. Sherman. An early-season species.

4 **Panorpa americana** Rambur.

A late-season species, collected as yet at only two localities, but no doubt more widely distributed. *Raleigh* (E-C), middle of September to late in October; taken by Sherman, Bentley, and Brimley. *Southern Pines* (S-E-C), September and October, by A. H. Manee.

5. **Panorpa carolinensis** Banks.

Taken in *Black Mountains* (W), by Wm. Beutenmüller, in June.

6. **Panorpa confusa** Hagen.

A late spring and summer species, not yet taken in eastern section. *Raleigh* (E-C), mid and late May, by Brimley. *Highlands* (S-W), early in July, Sherman. *Blowing Rock* (N-W), late in June and August, Sherman.

7. **Panorpa lugubris** Swed.

This is an exceptional species. While its general appearance and structure mark it at once as a Panorpid, its *color* and *habits* are very unlike the other members of the family observed in the State. The wings, instead of being hyaline or yellowish, marked with black or brown, as is usual in the group, are glossy black, marked with white. The abdomen is red, and this combination of red and black colors, combined with the snout and the pinchers at the tip of the abdomen of the male, gives the insect a truly satanic aspect; yet, when examined without prejudice, it is a handsome species. While most Panorpids are found in low grounds, where there is a rank undergrowth, this one is found in grassy fields and pastures, especially the higher and drier portions. When persistently pursued it drops in the grass and feigns death or, at least, remains concealed. I have seen several specimens surrounding and feasting upon a dead grasshopper in a path. It is a fall species, apparently common every year, but more abundant in some years than others. Taken at *Raleigh* (E-C), from early in September to early in November, by Sherman, Brimley, and Bentley. *Southern Pines* (S-E-C), early in October to early in November, by Manee. *Faison* (E), middle of October, Sherman.

8. **Panorpa maculosa** Hagen.

A delicate species, thus far taken only in summer, in the mountains. *Hendersonville* (W), June, Sherman. *Highlands* (S-W), early in July, Sherman. *Blowing Rock* (N-W), late in July and August, Bentley and Sherman.

9. **Panorpa nebulosa** Westw.

A late-spring and early-summer species, which our records indicate to be of general distribution in the State. *Havelock* (E), early in May, Woglum. *Raleigh* (E-C), early in June, Woglum. *Hot Springs* (W), Mrs. Slosson. *Lake Toxaway* (W), Mrs. Slosson. *Highlands* (S-W), early in June and July, Sherman. Not yet taken by Mr. Manee at Southern Pines.

10. **Panorpa rufa** Say.

I have been informed by Mr. Banks that the type specimen of this fine species is in a museum in England. It was taken in Georgia and, as the species had never again been recorded, was suspected of being a synonym or variation of some of the other better-known species. On December 25, 1902 (Xmas-day), which was a warm, bright winter day, I took a specimen at *Wilmington*, in the southeastern part of our State, near the coast, where the more typically southern forms of life are to be expected. Several years later Mr. A. H. Manee took it at *Southern Pines* (S-E-C) and, learning that it was a rarity, he has since noticed more closely and finds it common in its season, which runs from the middle of October to the middle of November. Mr. Manee has sold a number of specimens to public institutions and private collectors; so that the status of the species is now fully established.

11. **Panorpa ruficeps** Rambur.

Our records indicate that this species occurs throughout the State, though not yet taken at Southern Pines by Mr. Manee, nor at Raleigh. The fact that we have it recorded in the months of April, May, June, and September, but not in July or August, indicates that it may be two-brooded. *Wallace* (S-E), mid and late April, Sherman. *Havelock* (E), early, mid, and late May, Brimley and Sherman. *Wilkesboro* (N-W), middle of September, Sherman. *Hendersonville* (W), June, Sherman.

12. **Panorpa signifer** Banks.

This species has been taken only in one western locality in our State, in midsummer. It is doubtless more or less distributed through our mountain region at least. *Blowing Rock* (N-W), August, Woglum and Sherman (two different years).

13. **Panorpa venosa** Westw.

This species may also be two-brooded. *Raleigh* (E-C), middle of September to middle of October, Brimley. *Southern Pines* (S-E-C), June, Manee.

14 **Panorpa virginica** Banks.

Until I sent Mr. Banks a series of this species from our western (mountain) section, he had seen it only from the vicinity of Washington, D. C. My records include four rather widely different mountain localities. The records indicate the possibility of two broods. *Hendersonville* (W), June, Sherman. *Highlands* (S-W), early in September, Woglum and Sherman. *Boone* (N-W), August, Sherman. *Blowing Rock* (N-W), August, Sherman.

15. **Panorpodes carolinensis** Banks.

Black Mountains (W), May 20th, Beutenmüller.

Description of a New Catocala.

By William Beutenmuller.

Catocala manitoba sp. nov.

Male and *Female*.—Head and thorax dull olive or ashen gray, with an olivaceous tint. Collar edged with brown posteriorly. Fore wings rather broad, olive gray or purplish brown, with an olivaceous tint Transverse anterior line black, distinct, with a rather strong outward curve from the costa to a little above the inner margin, and preceded by a slight brown shade. Basal dash black, scarcely extending to the middle of the basal area, sometimes absent. Basal line black, dentate, and extending to the basal dash. Transverse posterior line black, narrow to the lower inflection, where it is broad. Tooth opposite the cell rather long, followed by a very short tooth; thence the line is almost even and somewhat concave in its course to the lower inflection. Subterminal line dentate, somewhat paler than the ground color, distinct, but not very contrasting Space between the posterior and subterminal lines filled with dull reddish brown from a little below the costa to the inner margin. Subapical shade very vague or absent. Reniform brown, disk and outline pale Subreniform rounded, resting on the reniform; brown and partly or wholly black-ringed. On the costa near the middle is a black mark Hind wings yellow. Median band black, somewhat angulate, irregular, and meeting a black basal shade at the inner margin. Marginal band black and more or less broken before the anal angle, where there is sometimes a detached spot. Fringes yellow, partly cut with black. Expanse 35 to 44 mm.

Habitat.—Cartwright, Manitoba, Canada, August to September (E. Firmstone Heath).

Types.—Collections: American Museum of Natural History, Rutgers College, and George J. Keller.

Closely allied to *C. præclara.* It may be readily known by the dark-olive or purplish gray-brown fore wings, with an olivaceous tint, and by the even brown space between the transverse posterior and subterminal lines. In *præclara* the fore wings are lichen green, with a silky lustre. The tooth opposite the cell in *C. manitoba* is long and followed by a very short one, while in *præclara* there are two long, sharp teeth. The hind wings of both species are similar in color and markings.

C. manitoba was erroneously considered by me to be the same as *C. titania* Dodge, and the note on the latter published by Mr. E. Firmstone Heath (Can. Ent., Vol. XXXIX, 1907, p. 376) belongs to *C. manitoba.* Recently I sent to Mr. G. M. Dodge a specimen of *C. manitoba* to ascertain if it was the same as his *C. titania*, and was informed that it is different. Mr. Dodge kindly compared my *manitoba* with the single existing type of *C. titania* in the collection of Mr. O. C. Poling. The remaining types of *C. titania* were destroyed by fire.

◆

Mr. E. T. Cresson, Jr., is working upon the dipterous family Ephydridae and would like to examine all the material possible, native or exotic. Present address, 141 Locksley Avenue, Oakland, Calif.

At a recent meeting of entomologists at St. Louis, Mo., an organization was effected to be known as the "Heink Entomological Club," so named by unanimous desire in honor of Mr. Chas. L. Heink, an enthusiastic collector and student and owner of one of the largest collections of Lepidoptera in the city. A constitution and by-laws were adopted and a fund created for the foundation of a circulating entomological library. The following officers were elected: President, Chas. L. Heink; Vice President, Paul M. Schroers; Recording Secretary, Aug. Knetzger; Financial Secretary, A. C. Kelbly; Trustee, Geo. Graf; Sergt. at Arms, Noel Poepping. Meetings to be held regularly once a month.—Aug. Knetzger, Secretary.

A Preliminary Systematic Arrangement of the Aleocharinae (Coleoptera) of the United States and Canada.

By A. Fenyes.

The following list is offered as an attempt to classify the Aleocharinae of America north of Mexico. The second edition of the Catalogus Coleopt. Eur. Cauc. et Arm. Rossic., has been used as a guide in arranging the genera common to both faunas, while the genera not occurring in the palæarctic region have been intercalated where they seemed to belong. Most of the genera created in Major Casey's "Observations on the Staphyl. groups Aleoch., etc.," St. Louis, 1906, have been omitted and their species transferred to the allied genera.

Nearly all the species described by Major Casey in his various papers on Aleocharinae have been enumerated, although undoubtedly a considerable number of them will prove to be synonyms. Many of these species are described from unique specimens and are probably only individual variations.

Only published genera and species are enumerated below. It is hoped that a corrected list may be printed from time to time. The list is necessarily imperfect, therefore corrections or additions will be appreciated by the compiler.

DINOPSIS.

1. *americana* Kr.
2. *myllaenoides* Kr.

GYMNUSA.

3. *brevicollis* Payk.
4. *variegata* Kiesw.

MYLLAENA.

5. *dubia* Gravh.
6. *intermedia* Er.
7. *minuta* Gravh.
8. *infuscata* Kr.
9. *fenyesi* Brnh.
10. *vulpina* Brnh.

BAMONA.

11. *carolinae* Csy.
12. *falliana* Csy.
13. *tenuissima* Csy.

GYRONYCHA.

14. *valens* Csy.
15. *texana* Csy.
16. *obscura* Csy.
17. *fusciceps* Csy.
18. *lineata* Csy.
19. *attenuata* Csy.
20. *pertenuis* Csy.
21. *fenyesi* Brnh.

OLIGOTA.

22. *apicata* Er.
23. *parva* Kr.
24. *pusillima* Gravh.
25. *pumilio* Kiesw.
26. *claviger* Csy.
27. *nugator* Csy.
28. *oviformis* Csy.

GYROPHAENA.

29. *affinis* Sahlb.
30. *bihamata* Thoms.
31. *fasciata* Marsh.
32. *vitrina* Csy.
33. *flavicornis* Melsh.
34. *uteana* Csy.
35. *gaudens* Csy
36. *monticola* Csy.
37. *pacifica* Csy
38. *lobata* Csy
39. *involuta* Csy
40. *antennalis* Csy.
41. *insolens* Csy.
42. *fuscicollis* Csy
43. *modesta* Csy
44. *gilvicollis* Csy
45. *laurana* Csy
46. *coniciventris* Csy.
47. *genitiva* Csy.
48. *sculptipennis* Csy.
49. *subpunctata* Csy.
50. *lacustris* Csy

50a. var *inconspicua* Csy.

51. *laetula* Csy
52. *rhodeana* Csy.
53. *fustifer* Csy.
54. *centralis* Csy.
55. *perpolita* Csy.
56. *tenebrosa* Csy.
57. *subnitens* Csy.
58. *compacta* Csy.
59. *obesula* Csy.
60. *micans* Csy.
61. *egena* Csy.
62. *exilis* Csy.
63. *strictula* Er.
64. *californica* Csy.
65. *geniculata* Mäkl.
66. *corruscula* Er.
67. *humeralis* Csy.
68. *texanella* Csy.
69. *socia* Er.
70. *melania* Csy.
71. *pallidula* Csy.
72. *pinalica* Csy.
73. *minutissima* Csy.
74. *atoma* Csy.
75. *vinula* Er.
76. *ocularis* Csy.
77. *angularis* Csy.
78. *floridana* Csy.
79. *dissimilis* Er.
80. *peninsularis* Csy.
81. *flavicincta* Jek.
82. *rufa* Melsh.

PLACUSA.

83. *complanata* Er.
84. *atrata* Sahlb.
85. *tachyporoides* Waltl.
86. *angustula* Csy.
87. *despecta* Er.
88. *tacomae* Csy.

APHELOGLOSSA.

89. *rufipennis* Csy.

DIESTOTA.

90. *funebris* Shp.

THECTURA.

91. *cuspidata* Er.
92. *americana* Csy.

THECTUROTA.

93. *tenuissima* Csy.
94. *capito* Csy.
95. *demissa* Csy.
96. *exigua* Csy.

OLIGUROTA.

97. *pusio* Csy.

HOMALOTA.

98. *plana* Gyllh.

SILUSA.

99. *alternans* Sachse.
100. *gracilis* Sachse.
101. *californica* Brnh.
102. *collaris* Csy
103. *cribratula* Csy.

104. *decolorata* Csy.
105. *nanula* Csy.
106. *pasadenae* Csy.
107. *pusio* Csy.
108. *valens* Csy.
109. *vesperis* Csy.

PHYTOSUS.

110. *fletcheri* Csy.
111. *littoralis* Horn.

BRYOBIOTA.

112. *bicolor* Csy.

THINUSA.

113. *maritima* Csy.
114. *obscura* Csy.

BRYOTHINUSA.

115. *catalinae* Csy.

LIPAROCEPHALUS.

116. *brevipennis* Makl.
117. *cordicollis* Lec.

DIAULOTA.

118. *densissima* Csy.
119. *insolita* Csy.

AMBLOPUSA.

120. *borealis* Csy.
121. *brevipes* Csy.

ASTHENESITA.

122. *pallens* Csy.

LEPTUSA.

123. *haemorrhoidalis* Heer.
124. *americana* Brnh.
125. *atrocephala* Brnh.
126. *brevicollis* Csy.
127. *canonica* Csy.
128. *caseyi* Feny.
129. *opaca* Csy.
130. *seminitens* Csy.
131. *semirufa* Csy.

PHILOTERMES.

132. *fuchsi* Kr.
133. *pennsylvanicus* Kr.
134. *pilosus* Kr.

EURYUSA.

135. *obtusa* Lec.

BOLITOCHARA.

136. *notata* Mäkl.
137. *densicollis* Csy.
138. *californica* Csy.
139. *punctiventris* Csy.
140. *aspera* Csy.
141. *nigripennis* Csy.
142. *obsolescens* Csy.
143. *arcuata* Csy.
144. *bakeri* Csy.
145. *collaris* Csy.
146. *laticornis* Csy.
147. *nigrina* Csy.
148. *brevicornis* Csy.
149. *minor* Csy.
150. *marginella* Csy.
151. *nanella* Csy.
152. *picta* Csy.
153. *laetula* Csy.
154. *suturalis* Csy.
155. *tristigma* Csy.
156. *texana* Csy.
157. *trimaculata* Er.

EUVIRA.

158. *debilis* Shp.

AUTALIA.

159. *puncticollis* Shp.
160. *elegans* Csy.

PALAGRIA.

161. *longipes* Woll.
162. *obscura* Grvh.
163. *dissecta* Er.
164. *tuscana* Csy.
165. *ithacana* Csy.
166. *subsimilis* Csy.
167. *texana* Csy.

168. *angulata* Csy.
169. *caviceps* Csy.
170. *pinalica* Csy.
171. *arizonica* Csy.
172. *fontinalis* Csy.
173. *acomana* Csy.
174. *cingulata* Lec.
175. *tenuicornis* Csy.
176. *gracilis* Csy
177. *parva* Csy
178. *bilimbata* Csy.
179. *perexilis* Csy.
180. *hudsonica* Csy
181. *laeviuscula* Lec.
182. *fissilis* Csy.
183. *impressifrons* Csy.
184. *robusta* Csy
185. *minuscula* Csy.
186. *longicollis* Csy.
187. *occidua* Csy.
188. *lucida* Csy
189. *asperula* Csy
190. *picina* Csy.
191. *evanescens* Csy.
192. *collaris* Csy.
193. *parvipennis* Csy.

ANEUROTA.

194 *sulcifrons* Csy.

MERONERA.

195. *venustula* Er.
196. *montana* Csy.
197. *obliqua* Csy.

CHITALIA.

198. *intricata* Csy.
199. *scutellaris* Lec.
200. *granulosa* Csy.
201. *illustris* Csy.
202. *bilobata* Say.
203. *canadensis* Csy.
204. *nigrescens* Csy.
205. *partita* Lec.
206. *floridana* Csy.

BORBOROPORA.

207. *quadriceps* Lec.

MYRMECOPORA.

208. *vaga* Lec.

TETRALLUS.

209. *bicolor* Brnh.
210. *densepunctatus* Brnh.
211. *fenysi* Brnh.

TACHYUSA.

212. *objecta* Muls. & Rey.
213. *smithi* Csy.
214. *gracillima* Lec.
215. *americana* Csy.
216. *carolinae* Csy.
217. *cavicollis* Lec.
218. *obsoleta* Csy
219. *parviceps* Csy
220. *subalutacea* Csy.
221. *missouriana* Csy.
222. *pruinosa* Csy.
223. *dakotana* Csy.
224. *illini* Csy.
225. *ornatella* Csy.
226. *arida* Csy.
227. *faceta* Csy.
228. *vespertina* Csy.

GNYPETA.

229. *helenae* Csy.
230. *deserticola* Csy.
231. *punctulata* Csy.
232. *crebrepunctata* Csy.
233. *ventralis* Csy.
234. *floridana* Csy.
235. *bockiana* Csy.
236. *manitobae* Csy
237. *brevicornis* Csy.
238. *nigrella* Lec.
239. *atrolucens* Csy.
240. *incrassata* Csy.
241. *leviventris* Csy.
242. *oregona* Csy.
243. *impressiceps* Csy.
244. *linearis* Csy.

245. *experta* Csy.
246. *curtipennis* Csy.
247. *abducens* Csy.
248. *shastana* Csy.
249. *horfordi* Csy.
250. *baltifera* Lec.
251. *alutacea* Csy.
252. *laticeps* Csy.
253. *placidula* Csy.
254. *majuscula* Csy.
255. *sparsella* Csy.
256. *lucens* Brnh.
257. *elsinorica* Csy.
258. *transversa* Csy.
259. *laticollis* Csy.
260. *mollis* Csy.
261. *pimalis* Csy.
262. *citrina* Csy.

TRACHYOTA

263. *cavipennis* Lec.
264. *lativentris* Csy.

BRACHYUSA.

265. *raptoria* Woll.

DAYA

266. *gigantula* Lec.

ATHETA.

267. *subtilior* Brnh.
268. *ambigua* Er.
269. *cambrica* Woll.
270. *sulcifrons* Steph.
271. *insecta* Thoms.
272. *melanocera* Thoms.
273. *elongatula* Gravh.
274. *aubei* Bris.
275. *gemina* Er.
276. *polaris* Brnh.
277. *angusticornis* Brnh.
278. *californica* Brnh.
279. *dichroa* Gravh.
280. *laevicollis* Makl.
281. *maritima* Mannh.
282. *proterminalis* Brnh.
283. [illegible] Brnh.
284. *fallaciosa* Shp.
285. *complana* Mannh.
286. *americana* Brnh.
287. *delicata* Brnh.
288. *pseudovilis* Brnh.
289. *sibirica* Mäkl.
290. *angustula* Gyllh.
291. *subdepressa* Brnh.
292. *arcana* Er.
293. *palustris* Kiesw.
294. *nitens* Mäkl.
295. *nigropolita* Brnh.
296. *amicula* Steph.
297. *festinans* Er.
298. *flaveola* Melsh.
299. *fulgida* Brnh.
300. *globicollis* Brnh.
301. *holmbergi* Brnh.
302. *impressicollis* Brnh.
303. *luctifera* Brnh.
304. *pennsylvanica* Brnh.
305. *polita* Melsh.
306. *pratensis* Makl.
307. *divisa* Mak.
308. *coriaria* Kr.
309. *sodalis* Er.
310. *pallidicornis* Thoms.
311. *nigritula* Gravh.
312*a*. v. *virginica* Brnh.
313. *euryptera* Steph.
314. *aquatica* Thoms.
315. *pertyi* Heer.
316. *castanoptera* Mannh.
317. *oraria* Kr.
318. *aspericauda* Brnh.
319. *bidenticulata* Brnh.
320. *crenulata* Brnh.
321. *crenuliventris* Brnh.
322. *fulgens* Brnh.
323. *fuscula* Csy.
324. *helenica* Csy.
325. *occidentalis* Brnh.
326. *planaris* Makl.
327. *truncativentris* Brnh.
328. *vasta* Makl.
329. *ventricosa* Brnh.
330. *dentata* Brnh.

331. *aemula* Er.
332. *granigera* Kiesw.
333. *abdominalis* Brnh.
334. *alutacea* Csy
335. *graminicola* Gravh.
336. *picipennis* Mannh.
337. *subrugosa* Kiesw.
338. *marcida* Er.
339. *setigera* Shp.
340. *columbica* Brnh.
341. *cursor* Mäkl.
342. *fenyesi* Brnh.
343. *moesta* Mäkl.
344. *recondita* Er.
345. *parvula* Mannh.
346. *canescens* Shp.
347. *sordidula* Er.
348. *celata* Er
349. *zosteræ* Thoms.
350. *baringiana* Brnh.
351. *sordida* Marsh.
352. *pygmaea* Gravh.
353. *parva* Sahlb.
354. *fungi* Gravh.
354*a*. v. *orbata* Er.
354*b*. v. *breviuscula* Mäkl.
355. *clientula* Er.
356. *luteola* Er.
357. *modesta* Melsh.
358. *pasadenæ* Brnh.
359. *analis* Gravh.
360. *cavifrons* Thp.
361. *filaria* Fvl.
362. *propera* Say.
363. *talpa* Heer.
364. *exilis* Er.
365. *arizonica* Csy.
366. *atriventris* Csy.
367. *borealis* Csy
368. *brunneipes* Csy.
369. *comparalilis* Mäkl.
370. *exigua* Say.
371. *falsifica* Say.
372. *geniculata* Mäkl.
73. *indentata* Say.
374. *insignis* Csy.
375. *littoralis* Mäkl.
376. *lucida* Csy
377. *minima* Say.
378. *ornata* Csy.
379. *pallida* Csy.
380. *pallitarsis* Kby.
381. *parallela* Csy.
382. *pedicularis* Melsh.
383. *quadripunctata* Say.
384. *semicarinata* Say.
385. *silacea* Er.
386. *tahoensis* Csy.
387. *ventralis* Csy.
388. *vestigialis* Er.
389. *wickhami* Csy.

PONTOMALOTA.

390. *opaca* Lee.
391. *californica* Csy.
392. *nigriceps* Csy.

ANEPSIOTA.

393. *quadricollis* Csy.
394. *terminalis* Csy.

TARPHIOTA.

395. *fucicola* Mäkl.
396. *pallidipes* Csy.

EURYPRONOTA.

397. *disdreta* Csy.
398. *scapula* Csy.

COLPOSURA.

399. *praelonga* Csy.
400. *parviceps* Csy.
401. *angusta* Csy.

SIPALIA.

402. *frontalis* Csy.
403. *impressula* Csy.
404. *parvipennis* Brnh.
405. *sparsipunctata* Brnh.

TOMOGLOSSA.

406. *luteicornis* Er.

CALLICERUS.

407. *canadensis* Csy.
408. *puberulus* Csy.

THAMIARAEA.

409. *americana* Brnh.

APTERONINA.

410. *schmitti* Wasm.

ASTILBUS.

411. *cavicollis* Csy.

TINOTUS.

412. *caviceps* Csy.
413. *imbricatus* Csy.
414. *trisectus* Csy.

HOPLANDRIA.

415. *lateralis* Mels.
416. *pulchra* Kr.

PLATANDRIA.

417. *mormonica* Csy.

TRICHIUSA.

418. *laevis* Csy
419. *polita* Csy.
420. *transversa* Csy
421. *compacta* Csy.
422. *parviceps* Csy.
423. *setigera* Csy.
424. *monticola* Csy
425. *convergens* Csy.
426. *hirsuta* Csy
427. *pilosa* Csy
428. *atra* Csy
429. *postica* Csy.
430. *virginica* Csy
431. *robustula* Csy.
432. *rigida* Csy.
433. *discreta* Csy
434. *carnicolor* Csy.
435. *parvicollis* Csy.

ECITOPORA.

436. *nitidiventris* Brues
437. *tenella* Wasm.

ECITONUSA.

438. *schmitti* Wasm.
439. *foreli* Wasm.

ECITONIDIA.

440. *wheeleri* Wasm.

DINOCORYNA.

441. *bisinuata* Csy.

MICRODONIA.

442. *occipitalis* Csy.

PLATYUSA.

443. *sonomae* Csy.

ZYRAS.

444. *angustulus* Csy.
445. *caliginosus* Csy.
446. *crematogastris* Wasm.
447. *fauveli* Shp.
448. *lautus* Csy.
449. *loricatus* Csy.
450. *lugubris* Csy.
451. *megalops* Csy.
452. *obliquus* Csy.
453. *planifer* Csy.
454. *rudis* Lec.
455. *schmitti* Hamilt.
456. *schwarzi* Wasm.
457. *seticornis* Csy.

XENODUSA.

458. *sharpi* Wasm.
459. *caseyi* Wasm.
460. *cava* Lec.
460a. v. *hirsuta* Wasm.
460b. v. *major* Wasm.
461. *montana* Csy.
462. *reflexa* Walk.
463. *angusta* Fall.

PHLOEOPORA.

464. *testacea* Mannh.
465. *corticalis* Grvh.
466. *ferruginea* Csy.
467. *oregona* Csy.
468. *sublaevis* Csy.

PACHYCEROTA.

uryi Csy.

BLEPHARRHYMENUS.

alidus Csy.
ximius Csy.
revicornis Csy.
acustris Csy.
racilis Csy.
rendeli Csy.
onticola Csy
aliventris Csy
randicollis Csy.

CHILOPORA.

mericana Csy.
uliginosa Csy.

ITYOCARA.

ubens Er.

PAROCALEA.

aicalica Epp.

MASIREMA.

humilis Csy.
nquilina Csy.
arviceps Csy.

OCALEA.

franciscana Csy.
grandicollis Csy.
vancouveri Csy.

OCYUSA.

asperula Csy.
brevipennis Brnh.
californica Brnh.

DINARDILLA.

liometopi Wasm.

MYRMECOCHARA.

debilis Wasm.
crinita Csy.
pictipinnis Kr.

OXYPODA.

496. *exigua* Er.
497. *irrasa* Mäkl.
498. *minuta* Sachse.
499. *sagulata*, Er
500. *frigida* Brnh.
501. *gatosensis* Brnh.
502. *opacicollis* Brnh.
503. *robusticornis* Brnh.
504. *subnitens* Brnh.
505. *tenera* Brnh
506. *convergens* Csy.
507. *impressa* Csy.
508. *nubifer* Csy
509. *saxatilis* Csy.
510. *glenoræ* Csy.
511. *nigriceps* Csy
512. *lineata* Csy
513. *hudsonica* Csy.
514. *fustiger* Csy
515. *californica* Csy.
516. *mimetica* Csy.
517. *amica* Csy.
518. *sylvia* Csy.
519. *lucidula* Csy.
520. *stygica* Csy.
521. *renoica* Csy.
522. *iowensis* Csy
523. *dubia* Feny.
524. *simulans* Csy
525. *truncatella* Csy.
526. *virginica* Csy
527. *obliqua* Csy
528. *perexilis*, Csy
529. *lacustris* Csy
530. *nevadensis* Csy.
531. *fusiformis* Csy.

HYLOTA.

532. *ochracea* Csy.

DASYGLOSSA.

533. *prospera* Er.
534. *fenyesi* Brnh.

STICHOGLOSSA.

535. *corticina* Er.

ISOGLOSSA.

536. *arcuata* Csy.

ACHROMOTA.

537. *fusiformis* Csy

THIASSOPHILA.

538. *angustiventris* Csy.
539. *asperata* Csy.
540. *laticollis* Csy.

CRATARAEA.

541. *suturalis* Mannh.

TERMITOGASTER.

542. *texanus* Brues.

DECUSA.

543. *expansa* Lec.

HOMOEUSA.

544. *acuminata* Mark.
545. *crinitula* Csy.

MYRMOBIOTA.

546. *crassicornis* Csy

ECITOXENIA.

547. *brevipes* Brues.

MASEOCHARA.

548. *semivelutina* Solsk.
549. *decipiens* Csy.
550. *valida* Lec.
551. *californica* Csy.
552. *ponderosa* Csy.
553. *rubicunda* Csy.
554. *puberula* Csy.
555. *basalis* Csy.

ALEOCHARA.

556. *curtula* Goeze.
556*a*. v *lustrica* Say.
557. *crassicornis* B. & L.
558. *lata* Grvh.
559. *puberula* Klg.
560. *morion* Grvh
561. *villosa* Mannh.
562. *fumata* Grvh
563. *moerens* Gyllh
564. *verna* Say
564*a*. v *languida* Sachse.
565. *bipustulata* L.
565*a*. v *pauxilla* M. & R.
566. *speculicollis* Brnh.
567. *gracilicornis* Brnh.
568. *densissima* Brnh.
569. *densiventris* Brnh.
570. *soror* Brnh.
571. *sparsicollis* Brnh
572. *anthomyiae* Spr.
573. *maura* Sachse
574. *rubripennis* Pettit.
575. *texana* Csy.
576. *fusicornis* Csy.
577. *sternalis* Csy.
578. *algonquina* Csy.
579. *medialis* Csy
580. *tahoensis* Csy.
581. *kansana* Csy
582. *pleuralis* Csy.
583. *ellipsicollis* Csy.
584. *americana* Csy.
585. *postpicta* Csy
586. *montanica* Csy.
587. *thoracica* Csy.
588. *collusor* Csy
589. *planiventris* Csy.
590. *bipartita* Csy
591. *laramiensis* Csy.
592. *rubripennis* Csy
593. *castaneipennis* Mann
594. *robustula* Csy
595. *glenorana* Csy
596. *uvidula* Csy
597. *rotundicollis* Csy.
598. *acomana* Csy.
599. *mannerheimi* Csy
600. *insulana* Csy.
601. *defecta* Csy
602. *affluens* Csy
603. *sculptiventris* Csy.
604. *imbricata* Csy.
605. *idonea* Csy.
606. *sulcicola* Csy.
607. *densiventris* Csy
608. *obsolescens* Csy.
609. *recta* Csy.

610. *bimaculata* Grvh.
611. *notula* Er.
612. *nitidicollis* Csy.
613 *nanella* Csy.
614. *innocua* Csy.
615. *deserticola* Csy.
616. *minuta* Csy.
617. *suffusa* Csy.
618. *acuminata* Csy.
619. *tibialis* Csy.
620. *sulcicollis* Mann.
621. *rugosa* Csy.
622. *debilicornis* Csy.
623. *cylindrella* Csy.
624. *maritima* Csy.
625. *pacifica* Csy.
626. *arenaria* Csy
627. *quadrifer* Csy.
628. *trilimbata* Csy.
629. *lucifuga* Csy.
630. *wickhami* Csy.
631. *nebnlosa* Csy.
632. *disjuncta* Csy.
633. *fenyesi* Brnh.

BIBLIOGRAPHY.

1. BERNHAUER MAX., Deutsch. Ent. Ztschr., 1905, 249.
2. " " Deutsch. Ent. Ztschr., 1906, 337.
3. " " Deutsch. Ent. Ztschr., 1907, 381.
4. BRUES, CHAS. T., Entom. News, 1904, 250.
5. " " Entom. News, 1902, 184.
6. CASEY, THOS. L., Ann., N, Y., Ac. Sc., 1892, 711.
7. " " Ann., N. Y., Ac. Sc., 1893, 282.
8. " " Ann., N. Y., Ac. Sc., 1897, 548.
9. " " Contrib. to the descr. and syst. Col. of N. Am., 2 parts, 1884.
10. " " Bull. Cal. Ac. Sci., 1886, 202.
11. " " Bull. Cal. Ac. Sc., 1885, 285.
12. " " Trans. Ac. Sc., St. Louis, No. 6, 1906.
13. " " Canad. Ent., 1904, 312.
14. " " Journ. N. Y. Ent. Soc., 1900, 53.
15. FALL, H. C., Occas. Pap. Cal. Ac. Sc., VIII., 1901.
16. FENYES, A., Ent. News, 1907, 60.
17. MANNERHEIM, C. G., Bull. Nat. Ges. Mosc, 1843.
18. " " Bull. Soc. I. Nat. Mosc., 1853, No. 3.
19. " " Bull. Nat. Ges. Mosc., 1846.
20. SAY, TH., Journ. Ac. Nat. Sc., Phil., 1823.
21. " Trans. Am. Philos. Soc., 1834 and 1836.
22. WASMANN, E., Deutsch. Ent. Ztschr., 1897, 273.
23. " " Deutsch. Ent. Ztschr., 1897, 280.
24. " " Deutsch. Ent. Ztschr., 1899, 409.
25. " " Krit. Verz. d. myrmekoph. u. termitoph. Arthrop., Berlin, 1894.
26. " " Wien. Ent. Ztg., 1901, 145.

Notes on the Coleoptera of Placer County, Calif.

By Julia D. E. Wright and Karl R. Coolidge.

The following species of Coleoptera were taken in the vicinity of Towle, Dutch Flat, and Alta, small mining towns of Bret Harte fame. In 1903 the former writer spent June, July, August, and a part of September at Towle, and April and May of 1907 were spent by the latter at Alta. Placer County is in the foothills of the Sierra Nevadas, the elevation at Alta being about 4000 feet. *Pinus ponderosa* and *P. lambertiana* are characteristic trees of that region, and many species, particularly in the *Coccinellidæ*, were found on them. The blossoms of *Arctostophylos* and *Ceanothus* were also rich in insect visitors. Considerable collecting was done at Lake Alta, a small lake below Alta, and around the banks Cicindelidæ were found abundantly. There is a good hotel at Lake Alta, and we would recommend this locality as an excellent entomological one. The following list is far from complete, but, from time to time, we hope to be able to add to it. We are much indebted to Drs. Blaisdel and Van Dyke for many identifications:

CICINDELIDÆ.

Omus californicus Esch. Fairly common in June.
" *rugipennis*. June.
" *sequoiarum* Cr. Rare; only one specimen in June.
Cicindela purpurea, var. *graminea* Schaupp A single specimen.
" *lauta* Casey. One specimen.
" *oregona* Lec. Abundant. May to September.

CARABIDÆ

Pterostichus ater Dej. Several taken in June.
" *tarsalis* Lec. Not rare in June
" *protractus* Lec. Common.
" *californicus* Dej. Found abundantly under stones and logs.
" *vicinus* Mann. Several under stones.
" *inanis*. One in June.
" *lustrans* Lec. June.
Amara sp.
Platynus subsericeus Lec. Abundant in July.
Anisodactylus consobrinus Lec. June to August
" *piceus* Men. One taken under stone.

DYTISCIDÆ.

Agabus lugens Lec. Rare.

SILPHIDÆ.

Necrophorus nigritus Mann. Two in July.

COCCINELLIDÆ.

Hippodamia convergens Guer. Very abundant on pine.
Coccinella polita Casey. A few on pine.
Mysia hornii Cr. Only one taken.
Chilocorus fraternus Lec. Fairly common.
Exochomus californicus Casey. Not rare on manzanita.
Hyperaspis sp., near *dissoluta* Cr. Rare.
Scymnus sp. Common on pine.
Cleis minor Casey. Several in June.

DERMESTIDÆ.

Anthrenus occidens Casey. Abundant on the blossoms of manzanita.

TROGOSITIDÆ.

Trogosita virescens Fab. September, in decayed pine.

BYRRHIDÆ.

Amphicyrta dentipes Er. June.

DASCYLLIDÆ.

Cyphon concinnus Lec. Very common on lilac.

ELATERIDÆ.

Adelocera profusa Cand. Very rare; a single specimen on a pine-stump.
Alaus melanops Lec. Also rare. June.
Pityobius murrayi Lec. A few examples taken on wing near ditch.
Corymbites cruciatus, var. *edwardsia* Horn. May, June. Very variable.
" *tigrinus* Fall. A single specimen on yellow pine in May.
Melanactes densus Lec. Occasional in June.
Aplastus optatus Lec. June.

BUPRESTIDÆ.

Chalcophora angulicollis Lec. Common in June.
Dicerca hornii Cr. Two in June.
Trachykele opulenta Fall. A specimen of this rare species was taken in August on cedar.
Buprestis gibbsii Lec. June, July, August.
" *lauta* Lec. Fairly common. June to September.
" *fasciata* ? Two in September.
Melanophima drummondi Kirby. Rare. August and September.
Anthaxia æneogaster Lap. Not rare.
Chrysobothris nixa. Common in September.
" *californica.* One *sp.* in September. Rare.

LAMPYRIDÆ.

Ellychnia californica Mots. Common in May and June, on oak. Very variable.

Podabrus comes Lec. June.

" *sp.*

MALACHIDÆ.

Listrus sp., near *pardalis* Casey.

CLERIDÆ.

Trichodes ornatus Say. Common in July on ceanothus.

LUCANIDÆ.

Platycerus californica. A single specimen in June.

SCARABÆIDÆ.

Canthon simplex Lec. Very common in May and June.

Aphodius pardalis Lec

Hoplia dispar Lec. On ceanothus.

Dichelonycha crotchii Horn. Rare.

" *vicini.* June.

" *lateralis* Fall var. Common.

Cremastochilus pilosicollis Horn. One specimen in road.

CERAMBYCIDÆ.

Ergates spiculatus Lec. July.

Hylotrupes amethystinus Lec Not uncommon in August

" *ligneus* Fab. Common in June and July

Brothylus gemmulatus Lec.

Calloides lorquini Buq Rare.

Clytus tanifer Lec Common in July.

Xylotrechus obliteratus Lec. One in July.

Neoclytus conjunctus Lec.

Ulochaetes leoninus Lec Two specimens on wing in August

Toxotus vestitus Hald Common in July. Very variable in size and color.

Pachyta spurca Lec. June and July.

Leptura obliterata Hald Common everywhere in July.

" *tribalteata* Lec.

" *grossa* Lec June. Rare.

" *laetifica* Lec Fairly common in June

" *chrysocoma* Kirby

" *crassipes* Lec June and July.

" *valida* Lec Rare One in July.

" *dolorosa* Lec. Also rare

Atimia dorsalis Lec. Several taken on wing.

Monohammus titillator Fab. Fairly common.

" *scutellatus* Say.

CHRYSOMELIDÆ.

Glyptoscelis illustris Cr.
Haltica bimarginata Say? On manzanita.
Timarcha intricata Hald. Rare.

TENEBRIONIDÆ.

Nyctoporis galeata Lec. Fairly common in June.
Coniontis robusta Horn. Not rare.
" *sanfordii.* One in June.
" *montanus.*
Eleodes dentipes Esch. Common in August.
" *parvicollis* Esch. Quite common.
" *cordata* Esch. Common in June.
" *scabicula* Lec. Common in June.
Iphthimus sublaevis Bland. Plentiful.
Centronopus parallelus Lec.
Cibdelis blaschkii Mann. June.
Helops opacus Lec.
" *punctatus* Gemm. One specimen under bark.

CISTELIDÆ.

Stenochidus cyanescens Lec. June. One specimen.
Cistela opaca Lec. Rare.

OEDEMERIDÆ.

Ditylus quadricollis Lec. Several on sand.
" *gracilis* Lec. Common in June.

MELOIDÆ.

Cantharis incommoda Horn. May and June.
" *stygica* Lec. Common.

OTIORHYNCHIDÆ.

Dyslobus segnis Lec. Plentiful in June.
Scythropus californicus Horn. Very common on pine.

CURCULIONIDÆ.

Pissodes costatus Mann. Rare.
Magdalis lecontei Horn. A few on pine.

◆

I HAVE observed that *Lim. obsoleta* had three broods here the past season, in April, June, and September. The first and second brood of larvae of this quite scarce Lepidopter feed on *Salix fluviatilis* and the autumn larvae on *Populus fremontii*, our cottonwood.

During September I took five or six specimens of *Thecla ines*, a Mexican species, and rarely taken in Arizona or Southern California, so Mr. W. G. Wright has informed me. Two or three I took on alfalfa, and the others on sunflower.—DR. R. E. KUNZE, Phoenix, Arizona.

The North American Species of Chariessa (Coleoptera).

By A. B. Wolcott, Chicago, Ill.

Three examples of an undescribed species of the genus *Chariessa* have been in my collection for many years. Specimens of the four species and one color variety known to occur in our fauna are now before me, and demonstrate that the nondescript is specifically distinct.

Our few species may be separated by the aid of the following table:

A. Abdomen entirely red.
  b. Thorax depressed, sides narrowing anteriorly, pubescence of thorax light red; elytra broadly dilated posteriorly. Length 7 14 mm. Cal., Tex., Mex. . . . . **elegans** Horn.
  bb. Thorax convex.
  c. Elongate, sides of prothorax parallel anteriorly, pubescence of thorax blackish; sides of elytra nearly parallel Length 9 mm. Cal., N. J. . . . . **dichroa** Lec
  c. c. Robust, sides of prothorax strongly narrowing anteriorly, pubescence of thorax whitish (or fulvous); elytra broadly dilated posteriorly. Length 6 8.5 mm. Tex., N. J., Mex., Nicaragua, Panama, Guatemala, Brazil . . . . **vestita** Chevr
A A. Abdomen black.
  d. Thorax moderately convex, narrowing anteriorly; elytra black. Length 7 13 mm. Fla., Ga., N J., D. C., N. Y., R. I., Mass., Pa., Ohio, Wis., Ont., Ill., Iowa, Neb., Kans., Ark., Ky., Tex . . . . **pilosa** Forst.
  Elytra black, lateral and sutural margins pale, femora usually pale . . . . *var onusta* Say.
  dd Thorax strongly convex, parallel anteriorly: elytra dark blue. Length 11 15 mm. Texas . . . . **texana** n sp.
  Elytra dark blue, lateral and sutural margins pale *var.*

C. vestita (Chevrolat (*Brachymorphus*), Col., Mex., Cent. ii, No 150 (1835); Klug (*Enoplium*), Abh. Berl. Akad., 1842, p. 361, tab 1, fig 10; Spinola, Mon Clérites ii, p. 88; tab 45, fig 2 (1844); Gorham, Biol. Cent. Amer iii, part 2, p 187 (1882); Laporte (*Corynetes spectabilis*) Silberman's Revue Ent. iv, p. 50, No 1 (1836).

In this beautiful species, which has erroneously been accredited to Spinola, the elytra and prothorax are blue, densely pubescent with erect whitish hairs, on each elytron before the middle there is a large transversely oval, velvety black spot;

the head, antennae (except the club), entire ventral surface of body and the legs are red, the pubescence of the parts is red; the mandibles, antennal club, tips of tarsal appendages and the tarsal claws are black. *Vestita* is a very broad species, the width equaling half the length.

Examples from the more tropical portions of its habitat show this to be a variable species in coloration, the tendency being for the bluish portions to become obscurely reddish and the pubescence more dense. In a Guatemalan specimen in my collection the elytra are violaceous, the prothorax dull aenous with a reddish tinge, the tarsi entirely red, and the mandibles black at tip only; the five apical joints of the antennae black, the pubescence of thorax and elytra fulvous and the velvety black spots of the elytra very large and round.

C. elegans Horn, Trans. Amer. Ent. Soc. iii, p. 87 (1870); Gorham, Biol. Cent. Amer. iii, part 2, p. 346; tab. 12, fig. 23 (1885); Rivers (*Lemberti*) Zoe vi, p. 396 (1894).

This species bears a slight resemblance to *C. dichroa*, but differs from it in many respects. *Elegans* is a much broader, more depressed species. It is a deep sanguineous red (the color fading in old material to a pale red, as described by Dr. Horn), the elytra blue with metallic lustre wanting; the antennae (the basal joint excepted) and the tarsi black. The prothorax in this species is much more coarsely and densely punctured while the elytra are less coarsely punctured than in *dichroa*.

C. dichroa LeConte (*Enoplium*) Rep. Exp. and Surv. 1857, xii, p. 48.

This species may be easily recognized by its elongate form, finely punctured thorax and coarsely punctured elytra. The coloring in this species is the same as in *C. elegans*, with the following exceptions: the blue of the elytra has a sub-metallic lustre, the prothorax is more shining, the legs and antennae are entirely black, while the scutellum is red, the pubescence of the head and prothorax is blackish.

Dichroa is by far the rarest species and according to Mr. Hopping the larvae of the two species seem to be indistinguishable. Both species breed in the same log—that of *Quercus douglasii* or Sierra foot-hill oak (at Kaweah, Cal.), and as this oak does not grow much above 2000 feet, Mr. Hopping thinks it probable that the species may in some localities breed in oaks of a different species. For this species and a fine series of *C. elegans* I am indebted to Mr. Ralph Hopping.

C. pilosa Forster (*Lampyris*), Nov. Spec. Ins. Cent. i, p. 40 (1771); Olivier (*Enoplium*), Enc. Meth. vii, p. 490 (1782); Say (*Enoplium*), Amer. Ent. iii, tab. 41, fig. 5 (1828); Klug (*Enoplium*); Abh. Berl. Akad., 1842, pp. 104 and 360 *nec.*, p. 113; Spinola (*Pelonium*), Mon. Clérites i; p. 356; tab. 34, fig. 5 (1844); LeConte (*Pelonium*), Ann. Lyc. Nat. Hist., N. Y., v, p. 32 (1849); Gorham (*Pelonium*), Trans. Ent. Soc., Lond., xxv, p. 417 (1877); Wickham, Can. Ent., xxvii, p. 252 (1895)

C. pilosa var. *onusta* Say (*Enoplium*), Amer. Ent. iii; tab. 41, fig. 1 (1828); Say (*E. marginatum* ?), Journ. Acad. Nat. Sci., Phila., iii, p. 188 (1823); LeConte (*Pelonium*), Ann. Lyc. Nat. Hist., N. Y., v, p. 32 (1849); Wickham, Can. Ent., xxvii, p. 252, fig. 20 (1895).

Chariessa pilosa and its color variety are so well known and easily recognized as to render needless the giving of any characters other than those contained in the table of species.

C. texana n. sp.

Elongate, black, thorax ferruginous, apical margin each side of middle with rounded black maculation, sometimes united forming a short, broad, transverse apical band. Head and thorax coarsely and very densely punctured pilose with long, erect yellowish hairs. Thorax slightly longer than broad, convex, disc feebly longitudinally impressed, sides parallel anteriorly. Elytra dark blue, sides nearly parallel, convex, moderately shining, the sutural margins strongly costate, the costae smooth and broad, each elytron with four more feebly developed costae, punctuation very coarse and dense at base, less deep and coarse toward apices, humeri very prominent, impunctate. Legs densely clothed with very long semi-erect hairs. Length 11-15 mm.

Sweetwater, Nolan County, Texas. Three specimens kindly given me by Mr. Willard Wooding.

This species is most nearly allied to *C. pilosa*, from which it is distinct by the different form of the thorax and by the form of the entire insect, the elytra are more coarsely punctured and moderately shining, and it is a much larger species; the colors of thorax and elytra are also greatly different from those of *pilosa*. The variety of this species is identical with the type excepting that the elytra are very narrowly margined, the pale margin being about half as wide as in *C. pilosa* variety *onusta*.

The North American Species of the Genus Erebia (Lepidoptera).

BY KARL R. COOLIDGE.

The species comprising the genus *Erebia* are all arctic in habitat or are found at high elevations in temperate regions. For this reason many of our species are rare in collections. The writer has been fortunate in obtaining most of the species, but several descriptions have been taken from figures. The following compose our fauna:

1. **fasciata** Butl.

♂—Wings above immaculate dark brown. Beneath paler, wlth a wide, grayish submarginal band on both wings, not quite reaching to the lower margin of the primaries; a more or less obsolete basal band; bands bordered with black.

♀—A reddish patch on primaries and a narrow band on secondaries above. Exp. 1.80–2 inches.

Habitat.—Alaska and Arctic America.

2. **discoidalis** Kirby.

Primaries reddish brown, with a triangular, obscure, reddish, discoidal stripe from base to posterior margin; costa grayish. Secondaries brown. Beneath primaries as above, tipped with gray. Secondaries beneath indistinctly marbled and clouded with gray and whitish; fringes whitish and brown alternately; body brown; antennae annulated with white. Exp. 1-1.50 inches.

Habitat.—Boreal America; Hudson Bay; Canada, Alberta.

3. **rossi** Curt.

Superior surface of wings dark reddish brown. On primaries toward apex two ocellated spots close together. Beneath as above, the ground color paler; on primaries the outer portion is a pale band containing a series of white points. Exp. 2 inches.

Habitat.—Boreal America; Hudson Bay; St. Lawrence Bay.

4. **disa**, var. **mancinus** D. and H.

Upper surface of wings blackish brown. On primaries a reddish submarginal band in which is contained three or four black spots, pupiled with white, the upper two more distinctly so. Primaries beneath as above. Under surface of secondaries brown, densely powdered with grayish scales; a broad, more or less distinct grayish-black median band, deeply indentated toward base, regularly sinuate outwardly; base grayish; a submarginal row of blackish lunules, sometimes obsolete; a whitish spot on secondaries; at costal margin and on outer edge of band a whitish, triangular patch. Exp. 1.50 inches.

Habitat.—Alaska; Rocky Mountains; British America; Lacombe, Alberta, Canada.

5. **vidleri** Elwes.

Wings above blackish brown; on primaries a yellow-brown band enclosing three small, dark-brown ocelli, the upper two pupiled with white. On secondaries a band extending about half-way across the wing, containing two brown spots, the upper small.

Habitat.—Seton Lake, near Lilloet, on the Fraser River, British Columbia.

6. **tyndarus**, var. **callias** Edw.

♂—Wings above brownish, with a broad, transverse, castaneous band on outer two-thirds of primaries, more or less distinct. At apical end is contained a black, duplex, bipupiled spot. Secondaries with a series of three small, black points, each in a castaneous ring; fringes brown. Primaries beneath castaneous except costal edge and apex, which are gray; markings as above. Secondaries grayish, with brownish scales; disk crossed by a deeply crenated line, anterior to which, near base, is another line nearly obsolete; spots as above. Body brown above, below dark gray; antennae brown, luteous below; club fuscous above, yellow at tip.

♀—Paler, the spots on secondaries sometimes more or less wanting. Exp. 1.50 inches.

Habitat.—Colorado; New Mexico.

7. **epipsodea** Butl.

♂—Upper surface of wings dark brown; generally three black, ocellated spots on primaries, broadly surrounded with reddish brown, widening anteriorly and narrowing in the submedian interspaces. A similar series on secondaries, three or four in number, surrounded with reddish brown. Primaries beneath as above, third ocellus obsolete or represented by a point. Secondaries beneath with outer margin paler and a curved median, blackish band; spots repeated, but reduced. Body and palpi brownish black; antennae and club brown above, buff below, fulvous at tip. Exp. 1.50 inches.

♀—Of same size; ocelli enlarged.

Var. *brucei* Elwes.

The fulvous patch on primaries divided into four parts by the subcostal and discoidal nervures. Above third median nervure a small, fulvous patch which contains two black dots, the white pupils obsolete. Beneath as above. I regard this as a local aberration.

Habitat.—New Mexico to Alaska at suitable elevations; common in Montana, Eastern Washington, and British Columbia.

Var. *brucei*, Summit County, Colorado, 12,000 feet; Fort Qu'appele, Assiniboia.

8. **sofia** Strecker.

Above both wings are dark brown, with an even submarginal band of rusty-yellow spots on primaries and four or five concolorous spots on secondaries; a tint of same color in cell of primaries. Beneath the primaries are reddish, pale in cell, with band repeated, but paler. Secondaries also paler, the spots yellowish white, with scales of fulvous about the edges. Exp. 1.50 inches.

Var. *alaskensis* Holland.

The number of light spots reduced, both above and below; usually three on primaries above and below, and two on inferior surface of secondaries.

Habitat.—Fort Churchill, Hudson Bay; Yellowstone Park, 7000 to 8000 feet; British Columbia; Wyoming; Colorado.

Var. *alaskensis*, Eagle City, Forty Mile Mission, Alaska; Yellowstone Park.

I take *sofia* to be a variety of the Siberian *maurisius* Esp., and it is also close to *E. kefersteinii* Er., another Siberian species.

9. **magdalena** Strecker.

Uniformly and entirely dark blackish brown on both surfaces of the wings, except the outer two-thirds, beneath which is a shade lighter. Exp. 2 inches.

Habitat. Colorado, 10,000 to 14,000 feet.

10. **youngi** Holl.

Above both wings are dark brownish black; on primaries a wide submarginal band of red spots, pupiled with black. On secondaries a concolorous series of rounded spots, not confluent as on primaries. Beneath paler; the spots of primaries more confluent, but less sharply outlined. Secondaries crossed by a broad-curved, median, dark band, defined on both sides by narrow black lines. External to this a paler band, more or less dusted with grayish scales. Succeeding this a moderately wide, dark-brown, even marginal band; pupils of above repeated.

Less dark upon upper surface of wings, the ocellated red spots more strongly developed. Exp. 1.50 inches.

Habitat. Forty Mile Mission, Alaska.

DR. WM. A. NASON has sold his collection of insects to the State Laboratory of Natural History, University of Illinois, Urbana, Ill.

Oviposition of Bibio albipennis Say.

By ARSENE GIRAULT, New Richmond, Ohio.

In early April, 1907, this species was very common at Olden, Missouri, occurring on various fruit trees in the large apple and peach orchards of the Ozark region. They were found as isolated examples clinging to the foliage, but on one occasion in the afternoon a single small swarm was observed at the edge of a peach orchard. They were flying erratically, occasionally alighting on the foliage of nearby trees. The species was present for at least eight or ten days, and a female deposited many eggs in a small box in which she was confined. Continued cold spells, however, interfered with their breeding and the eggs failed to hatch.

On May 17, 1907, along the Ohio River, at New Richmond, Ohio, many single examples of this species were again met with on the foliage of apple, peach and other trees. Three gravid females were captured on that date and confined during the afternoon of the same day in a jar containing moist soil. As expected, they had disappeared under the soil by the morning of the 19th, and early in the morning of May 22d the egg masses were found at the bottom of the jar under 65 mm of soil, each mass partly enveloping the now dead body of the female.

The eggs were deposited in a more or less regular mass, side by side and on their ends, the rows often over-lapping, and each mass averaged 2211 eggs by actual count. The eggs are of the usual dipterous form and color, being oblong with both ends rounded, and with one side slightly convex, and the other slightly concave. Their color is sordid yellowish white, they are translucent, opaque at the ends, their contents granulated, and surface apparently simple. In structure they are very delicate. To the naked eye they are minute and inconspicuous when single, and the whole mass is not wider than 6 or 7 millimetres. The eggs average 0.558 mm. in length. They die when taken from their positions in the soil and exposed to the atmosphere.

I am indebted to Mr. D. W. Coquillett, U. S. National Museum, for determination of the species.

A new Anisota from Arizona (Lepidoptera Heterocera, Ceratocampidae).

BY C. R. BIEDERMAN.

A. skinneri n. sp. ♂.

Form that of *A. virginiensis*. Antennae, head, thorax and abdomen a deep rich ochreous yellow. Primaries reddish brown, spot on discal area silver white, 1 mm. square, basal corners slightly rounded; 4 mm. from the external margin and parallel to it runs a narrow bluish band. Costal margin marked by a dull brown band 1 mm. wide. Secondaries a rich purple brown, somewhat lighter at the costal margin, deepest at the base. Under side: abdomen, two-thirds its length from thorax nearly naked, grayish brown; primaries same as upper surface except limbal area, which is a dull grayish brown, discal spot dull white; secondaries dull grayish brown, with basal patch of purple brown. Expanse 53 mm. The female is much larger, expanse 71 mm., of lighter color and marked in the same manner.

Life-history of *Anisota skinneri*: Eggs found on August 20th hatched September 1st–5th inclusive. Young larvae grayish-brown, naked, 2 mm. Commenced to feed 4 days after emerging. Changed to reddish-brown September 10th. Changed to dull red September 13th. September 16th skin shows tiny ridges like paper crumbled up and smoothed out again. This form of skin stays to time of pupation. First pupation September 29th, last October 5th. No moulting whatever; no spinning of cocoon. Chrysalid naked in the loose ground 2 to 3 inches under surface, sandy earth preferred with a layer of dead leaves on top. They cease feeding and wander aimlessly around cage, color fades to a reddish clay and anal portion and head shrink towards center with slight swells. My experience of last year teaches me that this larva when freely handled will wander about, feed very irregularly and little, and finally die; of 22 I saved only 2. This year they were not handled and all but one went underground. Food, black (live) oak.

Average length of grown larvae 56 mm. The emerged larva shows no spines at first, but elevated dark punctures where they grow afterwards. Adults emerged last year August 5th.

◆

IN *Science* for January 24, 1908, is a brief statement of the aim and methods of the Concilium Bibliographicum.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., FEBRUARY, 1908.

We were pleased to learn from the minutes of the Secretary-Treasurer and other sources, that the Chicago meeting of the Entomological Society of America was a great success, and that the attendance was large. We also learned from one of our correspondents that Dr. James Fletcher of Ottawa, First Vice-President, conducted the meeting in his usual inimitable happy manner. It is an excellent thing to have officers who will make long journeys at a sacrifice when duty calls. The new officers are an honor to the Association, being men of ability and eminence, and their names shed lustre on the infant Society. It is to be hoped that the next meeting to be held in Baltimore will be equally brilliant as to attendance and papers, and that the same policies and precedents that were so successful in Chicago will be adopted in Maryland. Our prediction that the Society would grow and flourish like a green bay tree has been fulfilled so we are happy.

◆

A CORRECTION. ENT. NEWS, p. 43, 1907, line 33, for S A Rohmer read S A Rohwer. I choose this opportunity to record *Pterochilus 5-fasciatus* Say, from Pueblo, Colo., July 31, 1907 (G M Hite). As far as I know the genus has not been been recorded from Colorado.—S A ROHWER, Boulder, Col.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

I SEND you the record of the capture of a specimen of *Calpodes ethlius* Cramer. This insect was once taken at West Farms, N. Y., about 40 years ago, I believe. The specimen referred to was taken by me here in Washington, D. C., over a bed of Canna on September 19, 1903.—CHAS. R. ELY.

MR. O. W. BARRETT is back in the Bureau of Plant Industry of the U. S. D. A., after a very pleasant summer and autumn among the cacao plantations of Trinidad, B. W. I., in the study of cacao pests and diseases for the Agricultural Society of Trinidad and Tobago.

IF Mr. Paul is correctly quoted, we would like to suggest that some of the wealthy society butterflies contribute a fund toward the promulgation of elementary knowledge about the metamorphoses of insects. The price of one of these swell balls would create a fund to perpetuate this journal for all time, whereas the ball lasts but a few hours. Of course, the price given in the newspaper account is greatly exaggerated:

"'A lie. The whole story of the live butterflies being loosed at the ball which I gave in Horticultural Hall is a lie. It is made out of the whole cloth and there is nothing whatever to it.'

"In this wise did James W. Paul, Jr., emphatically stamp this story, which appeared first in Philadelphia and later in papers throughout the country, and which has occasioned not only amusement but indignation in some quarters here.

"'It is absurd to think of such a thing being done,' continued Mr. Paul, 'for if butterflies had been sent from such distant parts as those ridiculous stories had it they would have been transformed into larvæ and caterpillars before their arrival here. It is all absolutely untrue.'

"Word came echoing back from New York yesterday that '15,000 educated butterflies had blazed the way for Miss Mary Astor Paul's entrance to society, and the entire ball cost $100,000.'

"Another account had it that 'the *piece de resistance* came when, at the height of the festivities, 500 beautiful butterflies, gathered from all corners of the earth, were released over the heads of the magnificently gowned and jeweled women and the bravely dressed men who had gathered as Mr. Paul's guests.'"

A NEW PUBLICATION, THE JOURNAL OF ECONOMIC ENTOMOLOGY, official organ of the Association of Economic Entomologists. Editor, E. Porter Felt, Albany, N. Y, State Entomologist, New York; Associate Editor, A. F. Burgess, Washington, D. C., Secretary Association Economic Entomologists; Business Manager, E. Dwight Sanderson, Durham N. H., Director N. H. Agricultural Experiment Station; Advertising

Manager, Wilmon Newell, Baton Rouge, La., State Entomologist Louisiana. Advisory Board: L. O. Howard, Chief of Bureau of Entomology, U. S. Dept. Agr.; James Fletcher, Entomologist, Dominion of Canada; H. T. Fernald, Professor of Entomology, Mass. Agr. College; S. A. Forbes, State Entomologist, Illinois; H. A. Morgan, Director Tenn. Agr. Experiment Station; Herbert Osborn, Professor of Zoology, Ohio State University.

At the twentieth annual meeting of the Association of Economic Entomologists held at Chicago, December 28, 29, 1907, a stock company composed of members of that association was formed for publishing a Journal of Economic Entomology, and arrangements were made for the immediate issue of the publication.

An agreement was entered into between this company and the association whereby the Proceedings of the Association of Economic Entomologists are to be published exclusively in this journal.

The Association of Economic Entomologists includes in its membership practically all the official economic entomologists of the world, nearly three hundred in number. Its proceedings have been published as a bulletin of the Bureau of Entomology, U. S. Department of Agriculture, and have furnished the medium for publishing a large number of papers giving the results of investigation in economic entomology, many of which would not have found ready publication elsewhere. These proceedings will now appear in the Journal of Economic Entomology, making the first two numbers each year. The last four numbers will contain similar contributions, notes, news, reviews of more important publications, etc. Ever since the untimely suspension of Insect Life, over fifteen years ago, there has been no place for the publication of short notices or longer reports upon investigations and experiments in economic entomology save the bulletins and reports of the U. S. Department of Agriculture, the Agricultural Experiment Stations, and the agricultural press, all of which have their distinctive fields and limitations precluding the publication of much worthy material.

During the last ten years the science of economic entomology has advanced in a most phenomenal manner. The general public has had frequent occasion to acknowledge its debts to applied entomology and the number of workers and the quantity and quality of work have increased in a manner far beyond expectation. The advent of the San Jose scale throughout the eastern United States, the tremendous losses occasioned by the Mexican cotton boll weevil in Texas and Louisiana, the destructive work of the gipsy and brown-tail moths in New England as well as many other important pests throughout America and the newly settled countries of Australia and South Africa, have turned attention to the work of the economic entomologist and its economic value as never before. Even more striking has been the work in the United States and South Africa upon the relation of ticks to the diseases of domestic animals and their control, and greatest of all have been the discoveries that malaria and yellow fever are carried by mosquitoes and the magnificent demonstrations of the application of this knowledge to the saving and safeguarding of human life.

The Journal of Economic Entomology will be issued bimonthly, February to December inclusive, each issue to contain fifty to one hundred pages, the size to be limited only by the financial support received and the papers offered. In size of page and style it will be uniform with the Proceedings of the Association of Economic Entomologists of former years (Bulletins of Bureau of Entomology, U. S. Dept. Agr.). The subscription price is $2 per year, in advance, plus 30 cents postage for foreign subscribers.

THE NOSE OF THE MOSQUITO.—STORIES FROM FLORIDA ABOUT THE INSECT'S LONG RANGE SCENT FOR BLOOD.—There is one fact to be taken into account in the natural history of the mosquito of which there seems to be a great deal of ignorance. I allude to the wonderful smelling power of that world-embracing insect. Let me begin by relating some facts which will throw some light on the subject, and doubtless surprise some readers.

I once sailed down the Florida coast bound for Key West. We were on a little schooner. The crew were two, the passengers likewise two. About the middle of the afternoon we arrived off one of the points of the coast, which taken together constitute Cape Sable. A river empties into the Gulf there, known as Shark River. It is one of the most notorious haunts of mosquitoes on the whole coast. The crew decided that it would not be prudent to pursue our journey that evening, and so we anchored. We were about a mile from the shore, which is there covered with tall mangrove trees. We prepared our supper and after it was eaten we camped on the deck, or in the cabin as pleased us. The time was June and the wind was blowing gently from the east in from the sea. There was not one mosquito. In the morning we cooked our breakfast and ate it. Wind either a calm, or gentle from the east. No mosquitoes. Then something happened—the wind came out from the west or northwest. Instantly the mosquitoes came out. At first one or two, then more and more. As soon as possible we got up our sails and proceeded to sea. The explanation is simple. As long as the wind blew from the shore to us, the mosquitoes were unconscious of our presence; when the wind commenced to blow from us to the insects they became aware of the existence of warm blood, and they lost no time time in going after it.

One night in the summer in Florida I camped in a wagon with a companion. The wagon was in a road which ran north and south. The wind was from the east, thus blowing directly across the wagon. I slept on the west side. The mosquitoes to the west of us were attracted to us by the smell of our blood. They came to us, but all stopped at me. My companion got no mosquitoes, got no bites at all, while I suffered a sleepless night.

Perhaps it is not generally known that the Florida coast is lined with lighthouses. One of these lighthouses north of Key West is called Sombrero. It is a frame of iron on which the dwelling and the lantern stand, and is five and one-half miles from the swampy, mangrove lined shore. This shore is the breeding place and home of mosquitoes. Probably no unprotected human being could survive there for a single night. I know well a couple who kept this light for a considerable period. Their experience and their testimony on the subject on which I am writing should be conclusive, so I questioned them first, as to the distance that mosquitoes can smell human blood. They said that sometimes they were overwhelmed with mosquitoes. Secondly, but when? Was it when the wind was blowing from the land? Were the insects blown to you? The answer was that the inroads of the insects were only when the wind was blowing from the lighthouse to the shore. And the keeper said not when the wind was blowing directly at right angles to the shore. I suggested that there might be a pond a little out of the nearest point of the shore. As to that he did not know, for I think he said he had never visited the shore.

It seems evident enough that if the mosquitoes were blown over, only those embraced in the narrow zone of the width of the lighthouse would ever get to the house, and as the wind never blows very long in one exact direction, varying and zigzagging about, no mosquitoes would ever get over the five and a half miles of water. The idea is absurd. Either the insects go to the lighthouse on purpose or they don't go at all.

Now, if a mosquito can smell warm blood five and a half miles, how much farther can he smell it? The common route in pleasant weather from the coast to Key West is to sail down along the shore to Boca Grande. Then the vessel steers straight for its destination, a distance of eighty miles. The route recedes from the land, and the distance becomes as great as thirty miles. The course is regulated by sounding and the vessel is not allowed to get beyond a certain depth of water.

I am well acquainted and have been for years with two men who have sailed across this course many times, regularly making trips from my house to Key West. They say that it has happened to them time and again that they would leave Boca Grande in the evening with a westerly wind. One of them would lie on his blanket on deck, asleep, while the other sailed the boat. There would be no mosquitoes on the [illegible]. The sleeper would sleep undisturbed. But after a while mosquitoes would appear and disturb the sleeper. When the wind began to come from the east, [illegible] the insects would disappear. Those already present [illegible] killed or quieted with blood after the wind [illegible] take notice that these observers were [illegible] with their eyes wide open, and repeated over and over [illegible] facts twenty years ago. Last summer I heard of [illegible] visit to our coast and of his investigation concerning this subject.—JOHN [illegible] WEBB, Osprey, Fla.

TRANSPARENT wings, colored or uncolored, detached from the body of an insect can be placed between two lantern slide covers and used as lantern slides, a few minute drops of glue serving to hold the wings in place. Any necessary lettering can be put on bits of Dennison's adhesive transparent tape, or of sheet gelatine, and inserted between the two glass covers before binding them together in the usual way.—P. P. CALVERT.

EREBUS ODORA IN WISCONSIN.—The small village of Oostburg can be found on the map forty-two miles north of Milwaukee and ten miles south of Sheboygan in Sheboygan County, Wisconsin. On July 27, 1898, I went out on my usual night trip to catch moths near the woods, where I sugared some tree-stems. Hundreds of insects appeared, of different sizes, and one was a very large one. Waiting for a favorable opportunity to strike with my net, I was rewarded with an almost perfect female *Erebus odora.*

On the night of July 22, 1907, I imagined that two bats were flying near my sugared trees for the purpose of devouring the moths which covered the tree-stems. Directing the red light of the bicycle-lamp toward the tree-stems, I saw a male and female *Erebus odora* feasting on the sweet I had provided. I caught the female that same night and July 24th I captured the male. Both specimens are almost perfect. On the night of July 27 and 29, 1907, I caught two female *Erebus odora.* One was somewhat damaged and the other very much injured. The last specimen I put in a large box, covered with screen, under the trees, expecting soon to catch the male As it did not appear within a week I took the female out and found it had deposited two hundred or more eggs, scattered all over the inside of box and screen. The eggs are of the size of cabbage-seeds, green of color, and round. About fourteen days after they were deposited the larvæ emerged. I did not know the food-plant of this caterpillar and, to my sorrow, all died of inanition.

It is an open question to me if the *Erebus odora* does breed in this vicinity. Of the five specimens I captured three are almost perfect and one fairly good. If they are stragglers from the South, could it be possible for them to arrive here in such a good condition? In making the long journey from the South they were certainly liable to be killed by bats or night-hawks or other enemies before they ever reached this northern country. Dr. J. W. Holland writes me that the larvæ feed on cassia in Cuba.

Do not some of the readers of the NEWS know of another food-plant to which the larvæ of the *Erebus odora* take?

On September 2, 1907, I caught a female *Erinnyis ello* on the flowers of the petunia. This insect likely was a straggler from the South, and still it is a perfect specimen.

I will be glad to hear from readers of the NEWS any opinions and experiences with regard to *Erebus odora*, and I would like to know if those insects breed also in our northern climate.—ED. WAS, M.D., Oostburg, Wisconsin.

Doings of Societies.

Meeting of the Brooklyn Entomological Society, October 3, 1907. The President, Dr. Zabriskie, in the chair; fifteen members and two visitors present.

Mr. Dow reported, on behalf of the Committee on Field Meetings, that numerous collecting trips to various localities in New York State and in New Jersey had been made during the past season. The results proved especially gratifying to the younger members, who fully appreciated the efforts of the more experienced collectors, of whom several usually accompanied the expeditions, to make the trips interesting and enjoyable.

The value of field meetings in establishing a closer relationship among members was emphasized, and it was earnestly recommended that they be continued and encouraged during the next season.

Mr. Davis exhibited two boxes of insects collected at Pinlawn, Long Island, among which were two specimens of *Elytroleptus floridanus*, a Floridian beetle, recorded in the East only once before, from Massachusetts. Mr. Davis pointed out that, although Long Island contained many excellent collecting grounds, all orders of insects, excepting, perhaps, Lepidoptera and Coleoptera, had been very much neglected, and in this connection he moved, after a full discussion by the members, that the Brooklyn Entomological Society commit itself to the preparation of a list of the insects of Long Island. The motion was carried.

Mr. Levison, in speaking of his season's work with shade-tree insects, stated that the Tussock moth proved, as usual, the most troublesome pest; the bag-worm and several species of *Datana* occurred locally in large numbers; *Pulvinaria*, sometimes so destructive to maple trees, was not abundantly present this year.

Mr Dow showed a specimen of *Catocala dejecta*, captured in July near Prospect Park, Brooklyn, and a specimen of *Basilarchia astyanax*, variety *albofascia*, taken at New Brunswick, New Jersey.

Mr. Davis's series of *Basilarchia astyanax* also included an example of the variety *albofascia*, from Staten Island.

Mr. Shoemaker exhibited a number of *Laertias philenor*, obtained from chrysalids, all of which had the tails considerably aborted.

GEO. P. ENGELHARDT, *Recording Secretary.*

Meeting of the Brooklyn Entomological Society, November 7, 1907. The President, Dr. Zabriskie, in the chair; fifteen members present.

Mr. Everett S. Howell, of Brooklyn, N. Y., was elected a member.

In an address entitled "Collecting *Bombus* at Banff, Alberta," Dr. Zabriskie gave an interesting account of a five weeks' trip, undertaken during the past summer in the company of thirty-eight tourists, to the Pacific coast and Alaska, returning over the Canadian Pacific Railroad.

Leaving New York on the 24th of July, stops were made at the Yellowstone National Park, at Portland, and Seattle, where a steamer bound for Alaskan waters was boarded. Visiting Sitka, Skagway, Glacier Bay, Muir Glacier, and Vancouver, the journey was continued over the Canadian Pacific Railroad to Banff, Alberta, where the travelers arrived on the 22d of August and remained for two nights and a day.

Giving due attention to the magnificent scenery, the beautiful flora, and the many other attractions for which this mountain resort is noted, Dr. Zabriskie did not neglect to observe in a general way the occurrence of insects. Considerable snow, still lying on the mountains, had fallen a few days previously; nevertheless, a number of butterflies, principally of the genera *Argynnis* and *Colias*, were seen on the wing. A species of flowering Goldenrod, not exceeding eighteen inches in height, proved very attractive to bumblebees, which, not being very active, could be easily taken with the bottle. Of the forty-seven specimens collected and exhibited, only nine were females. The variation of color and size, so usual in species of *Bombus*, in this case was most apparent in the maculation; seven species, however, could be readily distinguished.

To further illustrate the variability of this family, Dr. Zabriskie showed a fine series of *Bombus pennsylvanicus*, ranging from the large females to the small workers and males, taken some years ago at Albany, N. Y., from one colony which had built its nest in a bird-house intended for wrens. Sulphur applied on this occasion to the nest, while killing the adults, had no effect on the pupæ, for these matured and hatched some days later.

GEO. P. ENGELHARDT, *Recording Secretary.*

A meeting of the Newark Entomological Society was held September 8th at the residence of Mr. Wm. H. Broadwell, the President in the chair, and twelve members present. Mr. Angelman remarked that he had secured eggs of *Cerura multiscripta*, all of which were black when first laid, and that all published data relative to color described them as gray. Mr. Keller reported the capture of two pairs of *Acronycta elizabeta* Sm., recently described, at Elizabeth, N. J., in August, and a specimen of *A. betulæ* at Mountain View, also in August. Mr. Dickerson reported the capture of a specimen of the former species at Chester.

Mr. Grossbeck remarked that he had taken at New Brunswick, on August 19th, a dozen specimens of the introduced *Vespa crabro*, which were attracted to a light in a room, and asked if any other Aculeates were known to be heliotropic. Prof. Smith said that it was a rare phenomenon, and usually occurred only when the nests of the insects were in some way damaged. This, however, was not the case in this particular instance, as the insects continued to be attracted to light for some weeks afterward and later the nest was discovered unbroken.

Mr Angelman said that moths were not as common in the early mornings on gas lamp-posts, etc., as in former years, and attributed the cause to the increase in numbers of the English sparrow.

Mr. Rockwell reported *Thecla titus* common during the past season.

J. A. GROSSBECK, *Secretary.*

The October meeting of the Newark Entomological Society was held on the 13th of the month at the residence of Mr. H. H. Brehme, the President in the chair, and eighteen members present. A vote of thanks was tendered to Prof. J. B. Smith and Messrs. E. J. Smith, of Natick, Mass., and C. F. Harbison, of Dayton, Ohio, for contributions of separates and other papers toward the formation of a new library. Mr. Wm. J. Erhard, of Newark, was elected a member of the Society.

Mr. Otto Buchholz gave an interesting account of his extended trips to Southern California and Arizona during the past summer. In California he found the territory so generally under cultivation that really good collecting ground for Lepidoptera was difficult to find. In Arizona he located at Prescott, in Yavapai County, an exceedingly rocky country, and collected chiefly at an elevation of between six and seven thousand feet altitude. In all between seven and eight thousand specimens of Lepidoptera and three to four thousand specimens of Coleoptera were collected, besides a lot of miscellaneous insects, reptiles, and minerals. Most all of the insect material was taken at light. Sugaring yielded small results, though it had been persistently followed throughout his stay. Collecting on tree-trunks was very poor, practically nothing having been taken in this way, and he attributed the cause to the insectivorous birds, the lizards, and a species of mantid which he found very numerous.

Mr. Buchholz also exhibited light- and dark-colored cocoons of *Hyperchiria pamina*, the difference in shade being due to environment at the time of spinning. Those larvæ left to spin up in leaves produced the usual brown cocoons, while others of the same lot, on being transferred to a box containing bits of white paper at the time indications of spinning were manifested, produced light-colored ones. The fact that the larvæ were fed throughout their lives on the same food in the same cage, and were yet able to spin differently colored silk, is extremely interesting. Mr. Buchholz said that the eggs of *H. pamina* hatch in precisely twenty-one days.

Mr. Gerstencorn exhibited specimens of hybrid moths produced by mating a male *Smerinthus ocellatus* with a female *S. populi*, both European species. The larvæ of both forms normally pass through four instars, but those of the hybrids passed through only three. The adults parted from copulation on May 14th and egg-laying began at once, the ova hatching on the 22d of the same month. The first moult was made on May 27th, the second on June 2d, and the last on June 8th, the larvæ entering the ground to pupate on the 14th of that month. The first imago emerged on the 8th of July and two others came out shortly afterward; the remaining pupæ did not disclose their imagines, and are passing the winter in good condition.

J. A. GROSSBECK, *Secretary*.

The November meeting of the Newark Entomological Society was held on the 8th of the month at Ferrg's Hall, the President in the chair, and fifteen members present. A vote of thanks was tendered Mr. Wm. Beutenmuller for the presentation to the Society of a copy of his monograph of Sesiidæ, and to Mr. Geo. A. Ehrman, of Pittsburg, for papers on Lepidoptera and Coleoptera. Mr. John Koller, of Newark, was proposed for membership and unanimously elected.

Mr. Wormsbacher exhibited a specimen of the recently described *Limenitis ursula*, var. *albofasciata* Newc., together with the type and allied species and varieties. Immediately following the short meeting the twenty-third anniversary of the Society was celebrated by a supper, at which all-around good humor prevailed.

J. A. GROSSBECK, *Secretary*

The December meeting of the Newark Entomological Society was held in the annex of the destroyed Turn Hall, at 182 William Street. A vote of thanks was extended to Dr. C. J. S

Bethune for his donation to the library of copies of his own and other publications, and to the Entomological Society of Washington for a set of their Proceedings to date.

Mr. Kircher exhibited a very large and evenly rounded cocoon of *Hyperchiria io* in which five living and well-formed pupæ were closely packed together. One part of the cocoon was slit open to demonstrate that absolutely no partitioning was between any of the pupæ. The specimen was spun in a breeding cage.

Mr. Buchholz showed an elegantly mounted series of the several species of *Rhynchagrotis* which he had taken during the past summer in Arizona.

The officers elected for the year 1908 were as follows: President, Prof. Henry Wormsbacher; Vice-President, George T. Rockwell; Corresponding and Recording Secretary, John A. Grossbeck; Financial Secretary, Herman H. Brehme; Librarian, William H. Broadwell, and Treasurer, Simon H. M. Seib.

J. A. GROSSBECK, *Secretary*.

◆

A meeting of the Heink Entomological Club, St. Louis, Mo., was held January 12th, Mr. C. L. Heink presiding. All but two members present. Mr. Heink exhibited a perfect specimen of *Erynnis leonardus* ♀ which he took last July, three miles south of the city, this being the first record of its appearance here. He also showed cocoons of *Automeris io* and related how he had secured several larvae of the same (20 miles from St. Louis) and bred them. This is believed to be a new record for this region. Mr. Schroers gave an interesting account of collecting Lepidoptera in different parts of Europe. Mr. Kelbly exhibited a new, adjustable spreading board, his own handiwork. He also showed a fine specimen of *P. turnus* ♀ (yellow), something very rare in this locality. Mr. Knetzger exhibited a number of imagos of *S. cecropia*, which he bred, among them an aberration, devoid of the bands on the forewings.

AUG. KNETZGER, *Secretary*.

THE ENTOMOLOGICAL SOCIETY OF AMERICA.

The third meeting of the Entomological Society of America was held at the University of Chicago, December 30 and 31, 1907, in affiliation with the American Association for the Advancement of Science, and other societies. About one hundred were in attendance, coming from as widely remote localities as Maine and California, Ottawa and Louisiana

On Monday sessions were held for the reading of papers, the program of which follows:

Notes on the Geographical Affinities of the Isle Royale, Lake Superior (An outline of the relations of the Isle Royale fauna (beetle fauna) to that of Northern North America General remarks on the major faunal centers based on beetles) —CHARLES C. ADAMS

Some problems in Nomenclature. (A brief discussion of the validity of names, particularly those bestowed on insect galls and larvæ)—DR. E. P. FELT.

Stereoscopic Photography Applied to Entomological Subjects (Exhibition of excellent stereoscopic effects brought about by an ingenious but simple apparatus) PROFESSOR F. L. WASHBURN

Life History and Habits of the Dimorph of *Chaitophorus negundinis* Thos (Previous knowledge of the dimorph. Comparison with a similar dimorph in Europe Life history, appearances in summer Part played in the survival of species, etc)—JOHN J. DAVIS

Is Mutation a Factor in the Production of Vestigial Wings Among Insects? (A summary of some observations among insects belonging to various groups, where the evolution of wingless or subapterous species can be traced within a genus or small group) CHARLES T. BRUES

The Sense of Sight in Spiders —DR ALEXANDER PETRUNKEVITCH

External Wing-Buds in Larvæ of Holometabolous Insects (A discussion of the general subject and recorded instances, and a report of an unrecorded instance)—DR WILLIAM A RILEY

Notes on the Nervous System of the *Corydalis* Larva A. G. HAMMAR

Notes on a Chalcid Infesting Apple Seeds C R CROSBY

The Mouth Parts and Phylogeny of Siricidæ J CHESTER BRADLEY

On Certain Structural Characters of the Genus *Catocala* W BEUTENMÜLLER

Is *Vespa borealis* an Inquiline? (An account of finding males and females of *Vespa borealis* living in the nest of *V. diabolica* on several occasions, apparently on perfectly friendly terms.)—DR. JAMES FLETCHER.

The Entomological Society of America and Its Work.—HENRY H. LYMAN.

The Habits of the Crane-Fly, *Dicranomyia defuncta* O. S.—DR. JAMES G. NEEDHAM.

The Life History of a Bee-Fly (*Spogostylum anale* Say); the Larvæ Parasitic on the Larvæ of a Tiger Beetle *Cicindela scutellaris* Say. (The eggs are laid in July and August; larvæ on the last larval stage of the host in the spring; when the host makes its pupal cell and the internal parts become semi-fluid, the parasite moults and grows very rapidly, completely destroying the host. (July) The pupa digs toward the surface by wriggling movements of the body, and the adult emerges when the surface is reached.) (Title only.)—VICTOR E. SHELFORD.

Circumfili in the Cecidomyiidæ. (A discussion of the morphology and taxonomic value of these organs.)—DR. E. P. FELT.

Ancestral Ephemeridæ from the American Permian Formation. (A group of true Ephemeridæ obtained from the Permian of Kansas. The earliest known true Ephemerids, and with the exception of a few Russian specimens, all that are known from the Permian. They present a distinct early stage in the evolution of the Ephemerid line.)—DR. E. H. SELLARDS.

Observations on the Life History and Adaptation of a New Semi-Aquatic Aphid. (Habits, life history, and specialization of *Aphis aquaticus, novus*, found on the water thyme; many remarkable adaptations to its semi-aquatic life.)—C. F. JACKSON.

The New Biological Field Station of Cornell University.—DR. JAMES G. NEEDHAM.

Collecting grounds Around Chicago.—A. KWIAT.

Habits of the Larvæ of *Lycaena*.—J. H. COOK.

On Monday evening the annual address was given before the Society by Professor Herbert Osborn, of the Ohio State University, his subject being "The Habits of Insects as a Factor in Classification." The address was followed by a most enjoyable smoker, at which the members of the Society and their friends were the guests of the Entomological Section of the Chicago Academy of Sciences.

At the Annual Business Meeting on Tuesday, the 31st, the following officers were elected:

President, Dr. William Morton Wheeler.
First Vice-President, Dr. John B. Smith.
Second Vice-President, Rev. Prof. C. J. S. Bethune.
Secretary-Treasurer, J. Chester Bradley.

Additional members of the Executive Committee: Dr. James G. Needham, Prof. V. L. Kellogg, Prof. Herbert Osborn, Prof. J. H. Comstock, Dr. P. P. Calvert, Mr. F. M. Webster.

STANDING COMMITTEE ON NOMENCLATURE.

To serve 3 years, Dr. H. T. Fernald.
To serve 2 years, Prof. T. D. A. Cockerell.
To serve 1 year, Dr. E. P. Felt.

COMMITTEE ON NOMENCLATURE.

Dr. Fernald moved, seconded by Dr. Smith:

1. That the Entomological Society of America hereby endorses the Code of Nomenclature, adopted by the International Zoological Congress, as the code which should be used by the members of the Society so far as it can be applied.

2. That cases not covered by this code which may be presented to the Society for consideration, be referred to a standing Committee on Nomenclature, to consist of three members, one member of which shall be elected each year for a term of three years, and the opinion of this Committee on cases referred to them, shall be reported to the Society at the first annual meeting subsequent to their reference to the Committee.

Mr. Bradley moved to amend by striking out the second clause, because entomology should not be treated as distinct from Zoology in general, and because the Commission on Nomenclature established by the International Congress of Zoology is the sufficient and proper body before which to bring such question for decision.

Dr. Fernald stated that the reports of the Commission on Nomenclature of the International Congress of Zoology are greatly delayed by the fact that the Congress meets only once in three years, and by the rule that a question must be presented at least a year before the meeting at which it is to be considered. It was not the intention of the mover that the Committee should act in opposition to or independently from the Commission on Nomenclature, but that it should be instrumental in voicing the needs of entomology before that body, which should be the final court of reference.

With that explanation, the amendment was withdrawn and the motion passed.

PUBLICATION OF A JOURNAL.

Perhaps the most important act of the meeting was embodied in the following resolutions adopted by the Executive Committee and confirmed by the Society:

1. That the Society undertake a publication to be called "Annals of the Entomological Society of America," to be issued in quarterly fascicles.

2. That it include only papers of importance or marked merit, and that each be issued and bound separately as well as in fascicles, so that each paper may be sold separately.

3. That proceedings of the meetings be included either at the beginning or end of each volume and form one separate, which is to be sent to all members of the Society.

4. That a subscription price of one dollar, in addition to the membership fee, be charged members for the annals, and that the subscription price to non-members, libraries, etc., be $3.00.

5. That an Editorial Board be selected by the Executive Committee, and that this Board shall select one of its members as managing editor, who, with his associates, shall be responsible for the selection of material to be published.

6. That, if possible, someone living in a suitable location and who can undertake the work of managing editor for a series of years, be selected for this position.

7. That details not covered in this report are to be determined by the Editorial Board.

8. That actual publication under the provisions of this report be inaugurated as soon as possible.

It will be seen from the above that all members will receive the number containing the full proceedings of the meetings free, and upon payment of One Dollar the entire annals; while the regular subscription price to non-members will be $3.00.

A resolution was passed limiting the number of Fellows for the present ten per cent. of the membership.

The meeting then adjourned, to meet next December in Baltimore.

During the sessions the Executive Committee elected the following Fellows: Justus Watson Folsom, William Joseph Holland, Clarence Preston Gillette, Lawrence Bruner, Mark Vernon Slingerland, Henry Clinton Fall, Charles Lester Marlatt.

The following were elected members: G. E. Sanders, Urbana, Ill.; G. D. Shafer, Ithaca, N. Y.; Dr. J. A. Nelson, Ithaca, N. Y.; A. G. Hammar, Ithaca, N. Y.; William H. Blatchley, Indianapolis, Ind.; A. B. Wolcott, Chicago, Ill.; E. S. Worsham, Atlanta, Ga.; R. W. Harned, Ag. College, Miss.; Dr. Alex. Petrunkevitch, Short Hills, N. J.; Prof. T. D. A. Cockerell, Boulder, Colo.; Wilmon Newell, Baton Rouge, La.; J. C. Hambleton, Columbus, Ohio; G. Ainslee, South Anthony Park, Minn.; L. H. Weld, Evanston, Ill.; Prof. B. H. Guilbeau, Baton Rouge, La.; J. Zetek, Urbana, Ill.; Prof. S. W. Williston, Chicago, Ill.; C. F. Curtis Riley, Mankato, Minn.; Dr. J. F. Abbott, St. Louis, Minn.; W. S. Fisher, Harrisburg, Pa.

During the sessions an exhibit of entomological specimens and materials was open for the inspection of those interested. The titles of the exhibit are given below:

Some Enlarged Photographs of Fossil Insects.—Charles T. Brues.

New Devices in Economic Entomology.—W. E. Hinds.

Stereoscopic Pictures of Insects.—Professor F. L. Washburn.

Dimorph of *Chaitophora negundinis* Thos.—John J. Davis.

Case of Fall Webworm Moths (*Hyphantria textor* and *H. cunea*) Showing Range of Variation of the Latter; Inflated Larvæ.—Henry H. Lyman.

Entomological Specimens and Equipment; Interesting Insects from Mexico, Cuba, and Indo Australia; New Species of *Dynastes*, etc.—Dr. G. Lagai.

Stereoscopic Photographs of Oryssidæ Taken with the Camera Attachment to the Zeiss Greenough Binocular Microscope. Mouth Parts of Siricidæ.—J. Chester Bradley.

Stereoscopic Photograph of a Tenebrionid Beetle Taken with an Ordinary Camera Using an Excentric Diaphragm. C. R. Crosby and J. C. Bradley.

J. C. Bradley,
Secretary-Treasurer.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted, by purchase or exchange, Bibliog. Amer. Econ. Ent., Part 4, in good condition.—E. A. Klages, 82 Belvidere Street, Crafton, Pa.

I am desirous of acquiring by purchase or otherwise the rarer species of North American as well as exotic Endomychidae, also all literature (particularly papers by Crotch, Horn, LeConte, etc.) relating to the family not in my possession.—L. B. Walton, Kenyon College, Gambier, Ohio.

Wanted—Cocoons and pupae for cash or in exchange.—American Entomological Co., 55 Stuyvesant Ave., Brooklyn, N. Y.

I am desirous to send interesting "Lamellicornia" from Ecuador. I would like identified species in exchange.—Prof. Francisco Campos R., Guayaquil, Ecuador (Apartado No. 484).

Wanted to Exchange—Missouri butterflies with collectors in the north, east, south and west.—Aug. Knetzger, 3822 McDonald Avenue, St. Louis, Mo.

I will exchange a fine selection of Missouri *Catocala* for others, from other States.—Ernst Schwarz, 6310 Newstead Ave., St. Louis, Mo.

I have *P. modesta*, *H. chersis*, *H. luscitiosa*, *P. achemon*, *A. bicolor*, *A. angelica*. *At. jorulla* pupae to exchange for *P. pandorus*. *Dar. versicolor*, *Cal. astylus* and other North American pupae—V. Musil, 1118. So. Trumbull Ave., Chicago, Ill.

Lepidoptera.—I have for exchange bred specimens of *Papaipema nitela*, *nebris*, *frigida*, *imperturbata*, *cataphracta*, *impecuniosa*, *marginidens*, *Nonagria. oblonga* and *Achatodes zaea*. Would like specimens of same genera.—F. E. Moeser, 238 Guilford St., Buffalo, N. Y.

I have one copy of Baron de Rothschild and K. Jordan's "Classification of Sphingidae" (part 57, Genera Insectorum), with beautiful plates. Will exchange same for North American moths.—G. Chagnon, P. O. Box 186, Montreal, Can.

I have for exchange Chrysalids of *Regalis imperialis*, *hylaeus*, *modesta*, *ajax*, *troilus*, *cresphontes*, *andria* and eggs of *Catocala piatrix*, *vidua* and perhaps others. Wish *Catocala* eggs and imagoes.—R. R. Rowley, Louisiana, Mo.

Wanted *Pachybrachys.*—I am trying to unsnarl the species of this genus and need much larger series than I now have. I will buy specimens from any part of North America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline, Mass.

Wanted for cash or exchange.—Large and showy North American insects of *all orders*, beneficial and noxious insects, specimens illustrating life histories.—Write to Dept. Natural Science, The Kny-Scheerer Co., 225-233 Fourth Ave., New York.

Lepidoptera for exchange. Would like Californian species not in my collection.—Erval J. Newcomer, Palo Alto, Cal.

Lepidoptera.—Pinned, in papers, complete data, in perfect condition for exchange. Would prefer to exchange for living pupae.—J. Russell, Digby, Nova Scotia.

Lepidoptera for Exchange.—*Catacola badia*, *antinypha*, *praeclara*, pupae of *luna*, *io*, *imperialis*, *cecropia* and *polyphemus.*—Jacob Duelks, Box 317, Stonington, Conn.

Wanted for cash or exchange.—Bull. U. S. Div. of Ento. (old series), Nos. 1, 5, 10, 26, 33. J. A. Lintner's New York Reports, Nos. 3 and 13. Illinois Reports, Nos. 14 and 20, Missouri Reports, Nos. 7 and 9.—E. F. Hitchings, Waterville, Maine.

Luna Cocoons.—I have a number of living *luna* pupae of other North American Lepidoptera or papered Lepidoptera new to my collection.—B. R. Bales, M. D., Circleville, Ohio.

I have pupae of *Lapara coniferarum* and *Cith. regalis* to exchange for *Theclas*, *Lycaena* and *Chrysophanus* not in my collection.—H. H. Brehme, 74 13th Ave., Newark, N. J.

I have pupae of *Papilio turnus* and *cresphontes*, *Sphinx luscitiosa*, *chersis*, *Ampellophaga myron*, *Triptogon modesta*, *Paonias myops*, *Smerinthus geminatus*, *Ceratomia undulosa* and *P. quinquemaculata*. Want other pupae in exchange.—John Kythca, 1347 So. Scoville Ave., Oak Park, Illinois.

Geometridae wanted, named or unnamed, particularly from the Northwest, Arizona, Montana, Idaho, North Carolina, Texas and Florida. Write first giving quantity and price. Will buy or exchange. Wm. H. Broadwell, 219 Plane St., Newark, N. J.

Would like to exchange 80 named species, many specimens of European Coleoptera (many nice sp. Carabus, Calosoma, etc.), for 50 named sp. of Coleoptera from western states.—C. Harnach, 527 W. 16th Street, Chicago, Ill.

A few pairs of that interesting beetle *Ignotus aenigmaticus* Slosson for any of the following Cremastochilus 5913, 5915, 5916, 5917, 5918, 5919, 5921, 2924, 5928.—L. H. Joutel, 164 E. 117th St., New York, N. Y.

Cocoons of *T. Polyphemus* and *Samia promethea* to exchange for *Samia cynthia*, *Attacus orizaba* or others.—J. J. Henneberger, 10114 Ewing Ave., Chicago, Ill.

Wanted. North American Diurnals, Spingidae and Catocalae. Offer in exchange large variety of European Lepidoptera.—J. McDunnough, Berlin, W. 30, Motzstr 6, Germany.

Wanted. Named or unnamed Elateridae and Buprestidae from all parts of North America. Will give named Coleoptera in exchange. C. O. Houghton, Delaware College, Newark, Delaware.

I wish to exchange Chrysalids of *E. imperialis*, *P. ajax*, *troilus*, *turnus*, *P. hylaeus* and many others for exotic material. G. H. Hosenfelt, 1656 Salena St., St. Louis, Mo.

Pupae of *Papilio ajax and troilus* for exchange, also a few specimens of *Anthocharis Pima and Stella*, from Arizona, Imagoes.—N. Weil, Calhoun, Ky.

Lepidoptera for exchange from 1907 with data and identified. Also chrysalids of *P. turnus*, *cresphontes* and *troilus*.—F. Malkmus, 4198½ Tibson St., St. Louis, Mo.

Will collect in any order and supply European material in exchange for Lepidoptera, especially cocoons and pupae.—J. W. H. Harrison, 181 Abingdon Rd., Middlesboro, England.

Luna Cocoons. I have a number of living Luna pupae to exchange for other living pupae or papered Lepidoptera new to my collection. B. R. Bales, M. D., Circleville, Ohio.

Will exchange living pupae of *E. imperialis*, *P. ajax*, *troilus*, *turnus*, *P. hylaeus* and many others for exotic material.—Geo. H. Hosenfelt, 1656 Salena St., St. Louis, Mo.

Wanted, the coming season for cash or exchange, a large number of living pupae, strong and healthy, of all Diurnal Lepidoptera and Noctua, *Papilio*, *Actias*, *Attacus*, etc. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

I desire to buy original collections of beetles from North, South or Central America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline. Mass.

Wanted.—A large number of all species of *Plusiotis*, *Prionus californicus*, *Derobrachus geminatus*, *S cessus*, *julianus*, *Dynastes granti*, *Tetracha carolina*, *Pasimachus mexicanus*, all species of Cicindelidae and all other big beetles (Coleoptera) for cash or exchange. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

PUPÆ OF LAPARA CONIFERARUM and CITHERONIA REGALIS FOR SALE.—H. H. BREHME, 74 13th Ave., Newark, N. J.

1,000 PIN-LABELS, TWENTY CENTS!

Printed from the smallest type made. About 20 on a strip. No trimming—One cut makes a label. Send Money Orders. [illegible] in multiples of 500, and no order will be filled for less than 500 each of 2 labels or 1,000 of one.

C. V. BLACKBURN, 82 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

FOR SALE:—PSYCHE Complete to end of Thirteenth Vol. (1906). A fine set, bound in morocco, with the exception of last two volumes. Price $50. for the set.

PHILIP LAURENT, 31 East Mt. Airy Avenue, Philadelphia, Pa.

WILLIAM J. GERHARD

SCIENTIFIC BOOKS

[illegible] CALLOWHILL STREET

PHILADELPHIA. PA. U. S. A.

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia [illegible] Scarce . . . . . . $[illegible]

—[illegible] original parts [illegible] $[illegible]

[illegible] [illegible] $[illegible]

[illegible] [illegible] writings of Thomas Say on the [illegible] LeConte 2 vols. [illegible] $[illegible]

[illegible] Études sur la famille des [illegible] $[illegible]

[illegible] $[illegible]

[illegible] $[illegible]

[illegible] [illegible] der Bienen [illegible] $[illegible]

Wanted for cash or exchange.—Bull. U. S. Div. of Ento. (old series), Nos. 1, 5, 10, 26, 33. J. A. Lintner's New York Reports, Nos 3 and 13. Illinois Reports, Nos. 14 and 20, Missouri Reports, Nos. 7 and 9.—E. F. Hitchings, Waterville, Maine.

Luna Cocoons.—I have a number of living *luna* pupae of other North American Lepidoptera or papered Lepidoptera new to my collection.—B. R. Bales, M D., Circleville, Ohio.

I have pupae of *Lapara coniferarum* and *Cith. regalis* to exchange for *Theclas*, *Lycaena* and *Chrysophanus* not in my collection.--H. H. Brehme, 74 13th Ave., Newark, N. J.

I have pupae of *Papilio turnus* and *cresphontes*, *Sphinx luscitiosa*, *chersis*, *Ampellophaga myron*, *Triptogon modesta*, *Paonias myops*, *Smerinthus geminatus*, *Ceratomia undulosa* and *P. quinquemaculata*. Want other pupae in exchange.—John Kythca, 1347 So. Scoville Ave., Oak Park, Illinois.

Geometridae wanted, named or unnamed, particularly from the North west, Arizona, Montana, Idaho, North Carolina, Texas and Florida Write first giving quantity and price. Will buy or exchange. Wm. H Broadwell, 209 Plane St., Newark, N. J.

Would like to exchange 80 named species, many specimens of European Coleoptera (many nice sp. Carabus, Calosoma, etc.), for 50 named sp of Coleoptera from western states.—C. Harnach, 527 W. 16th Street, Chicago, Ill.

A few pairs of that interesting beetle *Ignotus aenigmaticus* Slosson for any of the following Cremastochilus 5913, 5915, 5916, 5917, 5918, 5919, 5921, 2924, 5928.—L. H. Joutel, 164 E. 117th St., New York., N. Y.

Cocoons of *T. Polyphemus* and *Samia promethea* to exchange for *Samia cynthia*, *Attacus orizaba* or others.—J. J. Henneberger, 10114 Ewing Ave., Chicago, Ill.

Wanted. North American Diurnals, Sphingidae and Catocalae. Offer in exchange large variety of European Lepidoptera.—J McDunnough, Berlin, W 30, Motzsh 6, Germany.

Wanted. Named or unnamed Elateridae and Buprestidae from all parts of North America. Will give named Coleoptera in exchange.—C. O. Houghton, Delaware College, Newark, Delaware.

I wish to exchange Chrysalids of *E. imperialis*, *P. ajax*, *troilus*, *turnus*, *D. hylaeus* and many others for exotic material.—G. H Hosenfelt, 3656 Salena St., St. Louis, Mo.

Pupae of *Papilio ajax and troilus* for exchange, also a few specimens of *Anthocharis Pima and Stella*, from Arizona, Imagos. N. Weil, Calhoun Ky.

Lepidoptera for exchange from 1907 with data and identified. Also chrysalids of *P. turnus*, *cresphontes* and *troilus*. F. Malkmus, 4105½ Tilson St., St. Louis, Mo.

Will collect in any order and supply European material in exchange for Lepidoptera, especially cocoons and pupae.—J. W. H. Harrison, 181 Abingdon Rd., Middlesboro, England.

Luna Cocoons. I have a number of living Luna pupae to exchange for other living pupae or papered Lepidoptera new to my collection. B. R. Bales, M. D., Circleville, Ohio.

Will exchange living pupae of *E. imperialis*, *P. ajax*, *troilus*, *turnus*, *D. hylaeus* and many others for exotic material.—Geo. H Hosenfelt, 3656 Salena St., St. Louis, Mo.

Wanted, the coming season for cash or exchange, a large number of living pupae, strong and healthy, of all Diurnal Lepidoptera and Noctua (*Papilio*, *Actias*, *Attacus*) etc. Kindly communicate with J. Sever, 115 E. 49th Street, New York City.

I desire to buy original collections of beetles from North, South or Central America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline, Mass.

Wanted.—A large number of all species of *Plusiotis*, *Prionus californicus*, *Derobrachus geminatus*, *S cessus*, *julianus*, *Dynastes granti*, *Tetracha carolina*, *Pasimachus mexicanus*, all species of Cincidelidae and all other big beetles (Coleoptera) for cash or exchange. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

PUPÆ OF LAPARA CONIFERARUM and CITHERONIA REGALIS FOR SALE.—H. H. BREHME, 74 13th Ave., Newark, N. J.

1,000 PIN-LABELS, TWENTY CENTS!

Printed from the smallest type made. About 30 on a strip. No trimming—One cut makes a label. Send Money Orders. Orders must be in multiples of 500, and no order will be filled for less than 500 each of 2 labels or 1,000 of one

C. V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

FOR SALE:—PSYCHE **Complete to end of Thirteenth Vol. (1906). A fine set, bound in morocco, with the exception of last two volumes. Price $50. for the set.**

PHILIP LAURENT, 31 East Mt. Airy Avenue, Philadelphia, Pa.

WILLIAM J. GERHARD

SCIENTIFIC BOOKS

2209 CALLOWHILL STREET

PHILADELPHIA, PA., U. S. A.

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia. 6 vols. 1861-67. Complete. Half morocco. Scarce $50.00

——Same. A copy in original parts, lacking vol. ii, No. 3 . . . . $45.00

Strecker, H. Lepidoptera Rhopaloceres and Heteroceres, etc. 15 parts and 4 supplements. 4 to. 1872-1900. 15 colored plates. Scarce. . $20.00

Say. Complete writings of Thomas Say on the Entomology of North America. Edited by J. L. LeConte. 2 vols. 1859. Cloth. 54 col. pls. . $16.00

Saussure, H. de. Etudes sur la famille des Vespides. I. Guepes solitaires ou de la tribu des Eumeniens. 1852. 22 colored plates $5.00

II. Guepes sociales ou de la tribu des Vespiens. 1853. 37 col. pls. $7.50

III. Monographie des Masariens. 1856. Lacks plates. $2.50

Muller, H. Befruchtung der Blumen durch Insekten. 1873. With, Weitere Beobachtungen, 3 parts. 1879-82. . . . . $5.50

FOR SALE

The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*,
C. arizonensis, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. baroni*, .50; *Pa*
machus mexicanus, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. ari*
nicus, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Moneilema gigas*, .40; *Ozodera*
tessellatus, .75; *Leptostylus yuccæ*, .50.; *Uroleca crucifera*, .20; *Nolaneta arizonica*,
Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus epigena*,
Oxycnemis advena, .50; *Psychomorpha phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia*
.40; *Syngrapha plumbifimbriatus*, .25; *Hatima sethus*, .75; *Triprocris rata*, .20; *Gingla la*
cula, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of N
American insects of all orders for sale, or exchange furnished on application.

F. H. SNOW - - - LAWRENCE, KANSA

The Celebrated Original Dust and Pest-Proo

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. X

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,

6, Gunterstone Road, West Kensington, London, W.

Cat. No. 17 for 1908 (now ready) mailed free on demand.

The only dealers' list giving authors' names throughout. 100 named spe
mens, 1 qual: ex Assam, 40 different species in papers, including *Papilio*
les, gyas, etc., mailed free on receipt of Post Office Order $4.00 Expla
Catalogue, with over 300 descriptions and many interesting notes 12 cents

PARCELS SENT ON APPROVAL FOR SELECTION.

LIVING COCOONS AND CHRYSALIDS

Papilio zolicaon 20c., ajax 12½c., turnus 10c., troilus 10c., philenor
asterias 10c.; Eudamus tityrus 5c.; Hemaris thysbe 12c.; Sphinx kalmiae
luscitiosa 40c., chersis 30c., plebeia 25c., D. hylaeus 20c., Cer. undulosa
Triptogen modesta 50c.; P. excaecatus 15c.; Eudryas unio 5c.; Euch. egle
Eucles querceti 8c.; Apatelodes torrefacta 5c.; Dat. ministra 5c.; S. cynthia
A. promethea 5c., angulifera 50c., cecropia 5., luna 20c., polyphemus 7c.;
io 8c.; E. imperialis 12c.; Cith. regalis 60.; Anis. stigma 8c., senatoria
giniensis 15.; D. rubicunda 10c. Reduction if taken in numbers.

Morpho specimens in perfect condition, expanded.—Morpho cypris $1.00 to $1.50;
$1.25 to $1.75; godarti, a large opal morpho, ♂, $3.00 to $6.00; ♀, $5.00; amathonte
Prices according to size and beauty.

O. FULDA, 816 Broadway, New York

he Butterflies of the West Coast

new book. Text, descriptive and critical, of all known species, illustrated thirty-two full page plates in best modern photographic color work, with ly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

account of the great fire in San Francisco the book is already practically of print ; is not in any dealers' stock, and only a few copies now remain in author's hands.

oyal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

LORED PLATES of the BUTTERFLIES of the WEST COAST

abridgement of the above, consisting of the full set of plates as issued in book, with names of all species printed on pages facing the plates, but no descriptive text ; issued as the best possible substitute for that more pensive book which will soon be unobtainable.

ze, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book dress the author.

G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

FOR SALE

ports N. Y. State Entomologist ; Nos. 1 to 14 inclusive (Nos. 1 to 12 are Lintners) ; 13 and 14 are Felt's). Sold together for $10.

ports Ills. State Entomologist ; Nos. 4 and 5 (LeBaron), $1.50 ; 6, 7, 8 and 9 (Thomas), $3.00 ; 16 to 22 inclusive (Forbes), $5. Sold separately as grouped and priced, or the whole lot for $8.50. Address

VERNON L. KELLOGG, Stanford University, California.

SPECIAL OFFER

American Sphingidae, mounted ; 30 different species (inclusive **Pholus lineni, Ph. rustica, Sph. kalmiae, Mar. modesta, Prot. ochus,** etc.	$10.00
pilio Blumei, India, in paper	1.20
" mounted, incl. box	1.50
lucidus, Calif., in paper, each	4.50
ulalumae, on pins, each	2.75
of **Cal. angulifera** per dozen	4.00

THE KNY-SCHEERER CO.

pt. of Natural Science, 404 West 27th Street, New York

NOVA SCOTIAN LEPIDOPTERA.

Beautifully Mounted, in very fine condition, fully named and dated.

specimens of 200 species, Catalogue value $65.00	**$40.00**
" 100 "	**20.00**
" 100 "	**10.00**
— European Lepidoptera, on pins	**5.00**

2300 specimens, Nova Scotian, to choose from. Expressage extra.

OHN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER C

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YORK

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.
K.-S. Section Cabinets.
Schmitt Insect Boxes.
K.-S. Lepidoptera Boxes, Coleop
and Duplicate Boxes.
K.-S. Screw Handle and Amer
Nets.
The Asta Insect Pins:
White, 60c. per 1000.
Black, 70c. per 1000.

Catalogue II, Entomological Supplie
Application.

THE KNY-SCHEERER C

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Srreet, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPOSIT
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect condition.
Single specimens and collections illustrating mimicry, protective
dimorphism, collections of representatives of the different orders of insects.
Series of specimens illustrating insect life, color variations, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect boxe
Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

P. C. Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

MARCH, 1908.

ENTOMOLOGICAL NEWS

Vol. XIX. No. 3.

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
T. CRESSON. HENRY L. VIERECK. J. A. G. REHN.
LAURENT. WILLIAM J. FOX. H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September**, in charge of the
logical Section of the Academy of Natural Sciences, Philadelphia
and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.
Outside of the United States and Canada, $1.20.
SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal
on longer insertions. No advertisement taken for less than
60 cents—Cash in advance.

☞ All remittances should be addressed to **ENTOMOLOGICAL**
Academy of Natural Sciences, 19th and Race Streets, Philadelphia,

---

NEW ARRIVAL

Having received a large shipment of Lepidoptera from Assam and Upper Burma, containing Papilios and other desirable species, including several varieties of Saturniidæ, which will be sold at very reasonable prices.

50 perfect specimens in papers, containing many Papilios, including *Papilio paris*, *Papilio helenus*, and many other desirable species; fifty different specimens; no duplicates. **$5.**

ONE DOZEN PAPILIOS, ALL PERFECT $2.25

Other rare specimens at reasonable prices.
Send for list and prices.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA,

ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in
especially cactii and herpetology—reptiles and amphibians if notified
the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E.
New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSEC

(EXCEPT ODONATA)

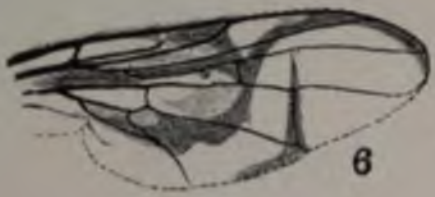
OF THE UNITED STATES

BY NATHAN BANKS

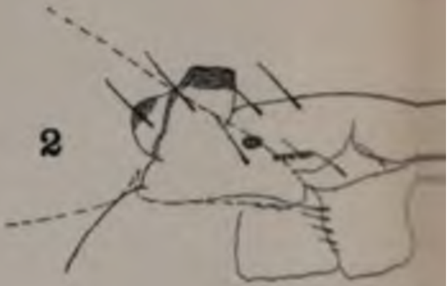
Complete to Summer of 1907 Price 50 cts. [illegible] per copy Mailed on receipt

E. T. CRESSON, Treasurer,
P. O. Box 248, Philadelphia

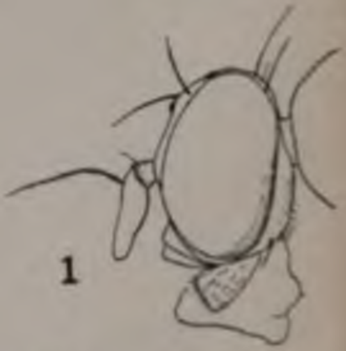
When Writing Please Mention "Entomological News."



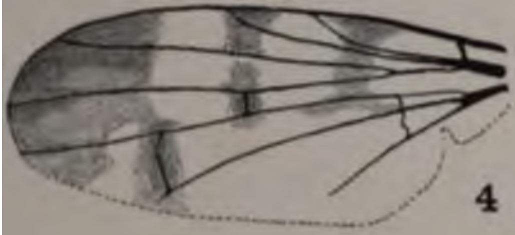
6



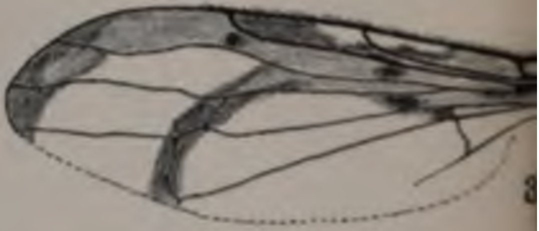
2



1

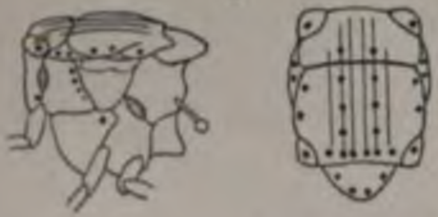


4

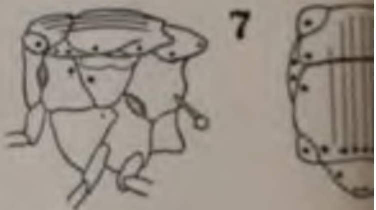


3

5



7



ORTALIDAE AND TRYPETIDAE (CRESSON).

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. MARCH, 1908. No. 3.

CONTENTS:

Cresson, Jr.—Two New Species belonging to the Dipterous Families Ortalidae and Trypetidae from Dutch Guiana. with Notes on others of these Groups 95
Braun—New species of Lithocolletis .. 99
Brimley—Male Polistes annularis Survive the Winter 107
Wolley Dod—Argynnis astarte, Doubl.-Hew., and other High Mountain Butterflies 108
Rowley—Notes on Catocala 115
Houghton—Notes on Necrophorus orbicollis Say 120
Woodworth—Winged Aphids 122
Wolley Dod—Further Notes on Alberta Lepidoptera 124
Cockerell—A Fossil Orthopterous Insect with the Media and Cubitus Fusing 126
Pearsall—Two New Species of Eupithecia Curtis 128
Oestlund—Chaitophorus Testudinatus in America 131
Girault—An Aphid Feeding on Coccinellid Eggs 132
Brimley—Notes on Some Neuropteroids from Raleigh, N. C 133
Brimley—North Carolina Records of Odonata for 1906 and 1907 134
Riley—The Abnormal Appearance of External Wing-buds in Larvæ of Holometabolous Insects 136
Editorial 140
Notes and News 141
Doings of Societies 142
Obituary 142

Two New Species belonging to the Dipterous Families Ortalidae and Trypetidae from Dutch Guiana, with Notes on others of these Groups.

BY E. T. CRESSON, JR.

(Plate VI.)

This material, in the collection of the Academy of Natural Sciences, Philadelphia, was collected by Miss K. Mayo in Dutch Guiana in the year 1905, except those from Idaho by Dr. H. Skinner in 1905. The South American species of these groups have been but little studied, and for that reason I have been fuller in my descriptions.

ZEUGMA gen. nov.

Head broader than high; occiput flat; eyes large; front narrow; orbits parallel. ocelli removed from vertex and widely separated; the anterior ocellus about equidistant from vertex and antennæ; vertex with stout outer- and inner-vertical bristles. Antennæ, situated below middle line of eyes, longer than the face, with third joint elongate; arista minutely pubescent. Face concaved; foveæ and carina indistinct. Proboscis short, thick.

Thorax with the following bristles: 2 pairs post-dorso-centrals, two post-alar, one supra-alar, two noto-pleurals, one humeral, no sternopleural, a fine hair in place of the propleural. Mesonotum flattened posteriorly; metanotum slightly oblique and convex. Scutellum flat, with four bristles.

Abdomen ♀ ovate; first segment somewhat slender at base. Legs stout, but only middle femora thickened basally; all femora, especially the posterior pair, with a series of short spines beneath towards apex; middle tibiæ alone spurred at apex. Wings with first vein bare, and approximated to the auxiliary; small cross vein is before the middle of discal cell; third and fourth veins parallel; anal cell obtuse.

This ortalid genus evidently belongs in the subfamily Richardiinæ somewhere near the genus *Hemixantha* Lw., from which it differs mainly in the basal position of the small cross vein. The type is the following species.

Zeugma palposa sp nov. (Plate VI, Fig 1.)

♀ Rufous, with bluish black abdomen. Lateral vertical angles of front, and the ocellar region, shining, otherwise front is opaque; one pair of fronto-orbital bristles which are above the level of anterior ocellus. Frontal orbits towards antennæ, orbits of face, cheeks, lower part of occiput, and an oblique line across occiput from lower part of posterior orbits to neck, silvery. Face more yellowish than front, with a brownish spot on each side near the oral margin; clypeus yellowish. Antennæ yellowish brown; third joint darker at apex, about five or six times as long as the second, widest at base and tapering slightly to a rounded apex. Palpi distinctly flabellate, yellow at base, whitish at its very broad tip, with a brown transverse median band, entirely silvery in certain reflections. Lateral turgid portion of the occiput black. Mesonotum subopaque, blackish in the middle of the anterior margin, with a median and lateral whitish pollinose stripe. Pleura polished, black, yellow pollinose near the coxæ; metanotum shining, rufous; halteres yellow. Abdomen shining, with short appressed hairs, ovipositor polished, the first joint not as wide, but nearly as long, as the two last abdominal segments. Legs yellow, with brownish femora bearing black spines, the hind femora are somewhat constricted or indented near the bases on the inside. Wings hyaline, without spots. Length 7 mm.

One specimen. Paramaribo, Dutch Guiana (K. Mayo).

Xanthacrona tuberosa n. sp. (Plate VI, Figs. 2, 3.)

♀ Yellowish-rufous; the ocellar tubercle, a spot on the mesonotum near the lateral roots of the scutellum, a narrow, short longitudinal stripe above the roots of wings, three spots on the scutellum, the narrow posterior margins of the abdominal segments and all bristles, black. Front opaque, bristles to the base of antennæ. Face more whitish yellow, opaque. Antennæ nearly as long as face; third joint broad and about six times as long as second, one-half its length in width, slightly concaved on the upper margin, apex rounded; arista brown. Cheeks about one-sixth of eye-height in width. Occiput shining. Thorax shining; two pairs of dorso-centrals, one sternopleural, but no propleural bristles. Scutellum polished, with four bristles, very much swollen, especially above, in form of two black, wart-like tubercles which project somewhat anteriorly over the mesonotum; each of these tubercles has a narrow black stripe running latero-posteriorly underneath to the metanotum; a third, but less pronounced, forms the median apex of the scutellum, also black. Halteres yellow. Abdomen shorter than the wings; first joint of ovipositor as wide as, but not longer than, the last two abdominal segments. Legs entirely yellow. Wings simliar to *X. bipustula* v. d. W.; first vein bare. Length 4.5 mm.

One specimen. Paramaribo, Dutch Guiana (K. Mayo).

This species differs from the typical description in the following points: front bristles on the sides to base of antennæ; antennæ nearly as long as face; scutellum with four bristles. In other respects it seemingly agrees. The remarkable tuberculated scutellum is merely a more developed form of the two black pustules characterized in the specific description of *pustula* v. d. W. (Biologia, Dipt. II, pp. 329). The wing-design can be readily seen from the figure given; the darker portion being grayish or black, while the remaining shaded portion is yellow. In general design this wing agrees with van der Wulp's species; therefore taking all together this species is no doubt a *Xanthacrona.*

It is well to mention here, that this genus is closely allied to *Myennis* R. D., differing, as van der Wulp mentions, but not as to the number of its scutellar bristles. There are still more important variations, as for instance: the position of the small cross vein in relation to the discal cell, and the long drawn out lobe of the anal cell of the genus *Myennis* R. D.

Melieria obscuricornis Lw. (Plate VI, Figs. 4, 5.)

Ceroxys Loew, Mon. N. A. Dipt., III, 126, 1873.
Melieria Coquillett, Journ. N. Y. Ent. Soc., VIII, 22, 1900.

Seventeen ♂, six ♀, Springfield, Idaho (Skinner).

Two ♂ and five ♀ of this series agree well with the typical description of this species, excepting that the antennæ are not brownish-black, but entirely rufous, infuscate sometimes at apex. The remaining sixteen approach *ochricornis* Lw. in having the costal spot above and that on the small cross vein more or less confluent, and the somewhat distinct marginal bands on the abdominal segments. On the other hand, the first, or basal wing-spot extends to the costa, showing a tendency towards *similis* Lw.; but this latter species seems very distinct in having the marginal bands of abdominal segments very wide and distinct.

The following is a typical description of these specimens, which I think well to give:

Front translucent yellow, orbits, vertex, face, cheeks, and occiput, whitish yellow pollinose; one or two pairs fronto-orbital bristles near vertex. Antennæ rufous; third joint sometimes infuscate at apex, arista blackish. Foveæ brown in the middle. Palpi yellow. Thorax and scutellum whitish yellow pollinose, with black bristles. Halteres white. Abdomen widest at second segment, gradually tapering to the apex, more grayish; posterior margins of segments 2-4 sometimes narrowly brownish; fifth segment of ♀ widened somewhat for the broad ovipositor, which is like colored, its first joint as long as the fourth and fifth segments together, gradually tapering to a truncate apex. All coxæ yellow, whitish pollinose; femora and tibiæ rufous, tarsi more or less infuscate. Wings yellowish hyaline; veins yellow except at the spot, the design as figured in Loew's Monographs, Vol. III, plate VIII, figure 20, but the first spot sometimes extends from the costa to the fifth vein, the second pair sometimes nearly confluent, and the apical cloud more or less confluent with the spot on the posterior cross vein.

Anastrepha serpentina Wied. (Plate VI, Figs. 6, 7.)

Dacus Wiedmann, Auss. Zweif. II, 521, 1830.
Acrotoxa Loew, Mon. N. A. Dipt., III, 227, 1873.

Two ♂ and two ♀ Paramaribo, Dutch Guiana (K. Mayo).

No doubt these are this species, but I will give here a short description of them as follows:

Head rufous to yellow; ocellar tubercle, a spot each side, two spots on the occiput above the neck, brown or black; two pairs of lower frontal bristles; antennæ nearly as long as face, third joint about four times as long as second. Thorax blackish-brown, rufous below, marked with light yellow as follows: mesonotum with a median stripe, which is broad behind and attenuated anteriorly, sometimes this stripe is margined with deeper yellow; a stripe each side of this, behind the suture and turning sharply inwards at the suture; humeri and stripes to base of each wing; a large spot behind the wings connected with the middle by another stripe; a short stripe along the upper margin of the sternopleura. Metanotum polished, black. Scutellum, except base, whitish, with four bristles. Halteres yellow. Abdomen black or brown, but base of first and second and a median stripe on the third and fourth, which broadens to nearly the entire width of fifth and sixth segments, yellow. Ovipositor rufous, not flattened, tapering, as long as abdomen. Legs rufous to yellow. Wings as figured, the lightly shaded portions being yellow and the darker portions dark brown.

Anastrepa pseudoparallela Loew?

Trypeta (*acrotoxa*) Loew Mon. N. A. Dipt., III, 230, 1873.

One ♀ Paramaribo, Dutch Guiana (Mayo) which is crushed too much for certain identification. It may be *fraterculus* Wied., but only the male has been described, and as this specimen agrees more with this species in regard to the length of the ovipositor, I have so determined it.

EXPLANATION OF PLATE VI.

Fig. 1. *Zeugma palposa*, lateral view of head.

Fig. 2. *Xanthacrona tuberosa*, lateral aspect of scutellum and thoracic dorsum.

Fig. 3. *Xanthacrona tuberosa*, wing.

Fig. 4. *Melieria obscuricornis*, wing.

Fig. 5. *Melieria obscuricornis*, thoracic chætotaxy.

Fig. 6. *Anastrepa serpentina*, wing.

Fig. 7. *Anastrepa serpentina*, thoracic chætotaxy.

New Species of Lithocolletis.

BY ANNETTE F. BRAUN.

Lithocolletis trinotella sp. nov.

Palpi, face, tuft and antennæ glistening snow-white; antennæ faintly annulate above with ocherous. Thorax and basal two-thirds of the forewings glistening white, below the fold somewhat suffused with yellow; apical third of the wings pale golden. A pale golden basal streak begins on the costa, extends nearly parallel to the costa for one fourth the wing length, then is bent downward and passes parallel to the fold into the golden apical portion of the wing. In the apical portion, there are two costal white wedge-shaped streaks and a similar dorsal one just before the tornus, opposite the first costal streak; all are internally margined with pale fuscous. A black apical spot. A pale fuscous marginal line in the cilia. Cilia whitish, faintly tinged with yellow. Alar expanse 5mm. Hindwings and cilia whitish. Abdomen pale grayish, ocherous above, whitish beneath. Legs whitish.

The unique type, a male, was taken in Essex County Park, N. J., by Mr. W. D. Kearfott, April 27.

Lithocolletis kearfottella sp. nov.

Antennæ grayish, darker toward the tips. Palpi shining white, with a slight golden tinge. Face shining white, with a slight golden tinge, tuft reddish saffron, scales darker toward the tips. Thorax and fore wings shining reddish saffron. A white band extends across the anterior margin of the thorax, passes over the patagia and is continuous with a basal white streak. The basal streak extends for one-third the wing length, nearly parallel to the costa and is dark margined above. Four costal and three dorsal shining white streaks, all dark margined internally. The first costal streak, at the basal third, is placed very obliquely, and is produced along the costa to the basal fourth. The first dorsal streak, at the basal fourth, is very large and very oblique. Near the costa its apex sometimes unites with that of the first costal streak, forming a very acute angle. The remaining three costal streaks are placed at equal distances from each other and from the first costal streak. The second costal streak is almost perpendicular to the costa and wedge shaped. Opposite to it on the dorsum, before the tornus, is the larger almost perpendicularly placed wedge shaped second dorsal streak. The third costal streak is inwardly oblique, curved, its apex pointing toward the apex of the third dorsal streak which is small, wedge shaped and placed beyond the tornus. The fourth costal streak is very oblique and curved. A large black apical dot. A brown line in the cilia extending from the fourth costal streak around the apex to the third dorsal streak. Cilia grayish. Just below the fourth costal streak, there is a darker brownish streak in the cilia, giving the appearance of a hook, as in *L. fitchella* Clem., but not as distinct. Alar expanse 7 mm. Hindwings pale grayish with a slight ocherous tinge. Cilia whitish gray, tinged with ocherous. Abdomen dark gray above, silvery white beneath. Anal tuft grayish, ocherous. Legs silvery white slightly shaded with ocherous, tibiæ and tarsi of the first pair very dark brown.

Three specimens, Montclair, N. J., bred by Mr. W. D. Kearfott, from mines on chestnut collected in October, 1901. The imagols appeared in the following spring.

Lithocolletis malimalifoliella sp. nov.

Antennæ gray. Palpi silvery white. Face silvery white. Tuft golden brown, tipped with dark brown. Thorax and forewings golden brown. There are three longitudinal stripes on the thorax, one median, the other two passing over the patagia and continuous with a median white basal streak, ending at one-third the wing length and dark margined above and around the tip behind. The dorsal margin is also white for a short distance. There are three costal and two dorsal white streaks of which the dorsal are the larger, all dark margined before, and the first pair dark margined at the tip behind. The first costal, at the basal third is small, oblique. The first dorsal, at the basal fourth, is very large, oblique and curved, ending just before the apex of the first costal. The second costal streak is small, nearly perpendicular, and opposite the second dorsal, which is triangular, and placed just before the tornus. The third costal streak, at the same distance from the second as the latter is from the first, is somewhat oblique, pointing forward. A third dorsal streak is indicated by the dark margin. An elongate black apical spot, with a few scattered brown scales before it. Marginal line in the cilia blackish with a distinct blue luster around the apex. Cilia gray, brownish around the apex. Alar expanse 5.5-6 mm. Hindwings dark gray. Cilia gray. Abdomen very dark gray above; silvery white beneath. Legs gray, hind tarsi blackish, grayish at their bases.

I have bred this species from small tentiform mines on the underside of apple, *Malus malus* (L). Britton. The appearance of the mine is entirely different from that of *L*, *blancardella* Fab. The mine is much wrinkled, and the leaf is strongly folded. The parenchyma is eaten in spots, giving the leaf a speckled appearance on the upper side. The pupa is suspended in a few silken threads. I also have flown specimens from Montclair, N. J., which are identical with the bred specimens.

Lithocolletis salicivorella sp. nov.

Antennæ pale grayish ocherous, faintly annulate with darker, somewhat darker at the tip. Palpi shining white. Face white. Tuft pale gray with an ocherous tinge. Thorax and basal third of the forewings ocherous gray. Wings becoming more ocherous towards the apex. A white band across the anterior margin of the thorax extends across the patagia and is continuous with a median basal white streak on the forewings.

There is a short dorso-basal white streak, somewhat dilated posteriorly. The median basal streak is curved downwards, and extends for two-fifths of the wing length, where it is confluent with the first dorsal streak, its upper edge uniting with the apex of the first dorsal streak. A few dark brown scales extend around the apex of the angle thus formed. There are four costal and three dorsal white streaks. The first dorsal streak at the basal fourth is very large, oblique and curved. Internally, it is dark margined just before it unites with the basal streak, the dark margin being continued around the angle and for a short distance along the lower side of the basal streak. The extreme edge of the costa is dark brown for about one-third of the wing length, where the dark line is deflexed, and continues as the dark margin of the first costal streak which is narrow, very oblique, its apex extending to a point just beyond the apex of the first dorsal. The second costal streak is large, nearly perpendicular, its apex opposite to that of the second dorsal streak, which is also very large, and placed slightly nearer the base than the corresponding costal streak, and is somewhat oblique. The next pair of streaks, of which the dorsal is placed just above the tornus, are nearly opposite to each other, slightly oblique toward the base and curved; their apices nearly meet. These two pairs of streaks are margined internally with brown scales. Fourth costal streak oblique, cuved and unmargined. A narrow line of black scales extends from below the apex of the last costal streak to near the apex of the wing, and is margined above by a line of white scales. Marginal line in the cilia dark brown, extending around the apex from the fourth costal streak to the third dorsal. Cilia grayish ocherous. Alar expanse 7 mm. Hindwings grayish. Cilia gray, with a fulvous tinge. Abdomen dark gray above, whitish beneath. Anal tuft grayish ocherous. Legs whitish, banded and striped with gray.

The unique type, a male of this species, was bred by Mr. W. D. Kearfott from a much wrinkled mine on the underside of a willow leaf, collected in Essex County Park, N. J., July 6, 1902. The imago appeared July 19.

This species is nearest to *L. scudderella* Frey & Boll, which it closely resembles in the costal and apical markings.

Lithocolletis tremuloidiella sp. nov.

Antennæ dark gray, the joints becoming lighter toward their bases. Palpi grayish white. Face grayish white. Tuft gray, mixed with white. Thorax pale reddish brown near the base, becoming more ocherous beyond the middle. There is a short median basal white streak, and a dorso-basal white streak, both thickly dusted with blackish scales, and uniting with the first dorsal streak. There are five costal and five dorsal white streaks, all dark margined internally and more or less dusted with blackish scales, the last two pair, however, not dusted. These streaks are situated as follows: a large oblique white costal streak at the basal fifth, attaining the middle of the wing and prolonged backward; nearer the base an oblique dorsal streak, almost meeting the first costal before the middle; the second costal streak also oblique; the second dorsal streak nearer the base than the second costal, large, oblique, strongly constricted just below the fold, and uniting with the apices of the first and second costal streaks; third costal and third dorsal streaks nearly opposite, less oblique, their apices separated by a narrow prolongation of the blackish internal margin. The fourth costal and dorsal streaks, of which the costal is at the apical fourth, the dorsal at the tornus, form an inwardly convex white fascia. Fifth costal and dorsal streaks also form a curved white fascia. An irregular blackish apical spot. Marginal line in the cilia blackish with a bluish luster. Cilia gray. Alar expanse 9-10.5 mm. Hindwings gray. Cilia gray with a reddish tinge. Abdomen dark gray above, grayish white beneath. Anal tuft grayish ocherous. Legs dark gray, tips of the tarsi lighter.

Described from specimens bred by Mr. W. D. Kearfott from tentiform mines on the underside of leaves of *Populus tremuloides* Michx., received from Mr. J. W. Cockle, Kaslo, B. C., Aug. 26, 1907. The imagos appeared during the same month. The mine is large (for an underside *Lithocolletis* mine), oval, and with a fine fold through its long axis. It closely resembles the mine of *L. salicifoliella* on poplar, but is very much larger.

There is considerable variation in the extent of the white markings; sometimes the fascia formed by the fourth pair of streaks is interrupted, and the fascia just before the apex does not reach the inner margin.

This species is very close to *L. salicifoliella* in the character and arrangement of markings; but may be distinguished from it by the much greater expanse, the slightly shining and more reddish ground color of the forewings, the slightly less oblique position of the white streaks, and by the noticeable bluish luster of the marginal line in the cilia. The specimens which appear in August are densely dusted, in this respect differing from the corresponding brood of *L. salicifoliella*.

Possibly this may be the species from Colorado, which Chambers doubtfully identifies as *L. salicifoliella*. (Cin. Quart. Jn. Sci., II, 302, 1875)

By some mistake this species has been referred to as *Lithocolletis populiella* Chambers by Mr. Busck in his paper "Tineid Moths from British Columbia" (Proc. U. S. Nat. Mus., XXVII, 770, 1904) and by Dr. Harrison G. Dyar in "Lepidoptera of the Kootenai District" (Proc. U. S. Nat. Mus., XXVII, 937, 1904).

Lithocolletis saccharella sp. nov.

Antennæ pale ocherous, beyond the basal third annulate with dark, several joints toward the tip dark. Palpi shining white. Face shining white. Tuft whitish, golden toward the sides. Thorax and forewings ocherous. A white stripe on each side of the middle of the thorax is continuous with a very oblique curved white streak at the inner angle of the forewing. This streak, which is sometimes dark margined behind, extends to the fold and is usually prolonged along the fold to unite with the first dorsal streak. The first dorsal streak begins at the basal fifth, is oblique and curved, and extends slightly more than half way across the wing. The second dorsal streak, at about the middle of the dorsal margin, is also oblique and curved, and near the costa, its apex meets that of the first costal streak, which is short, oblique and placed slightly beyond the middle; thus forming an acutely angled, interrupted fascia The second costal streak, at the apical fourth, is sometimes almost overlaid with black scales Above the dorsal cilia is a long oblique white streak. All the streaks are dark margined externally Apical portion white dusted with black There is considerable variation in the extent of the black dusting, which sometimes extends to the tornus Marginal line in the cilia brownish ocherous Cilia pale ocherous Alar expanse 5.7 mm. Hindwings pale grayish ocherous Cilia pale ocherous Abdomen gray above, pale ocherous below Anal tuft ocherous Legs whitish. Hind tarsi faintly tipped with black

Described from specimens bred at Cincinnati, Ohio. I also have specimens taken in Essex Co. Park, N. J., by Mr W D Kearfott.

The mines of this species are very common on Sugar Maples *Acer saccharum*, Marsh. and *Acer nigrum* Michx., as many as 25 or 30 mines sometimes occurring on one leaf. The mine is a small irregular blotch on the upper side. The pupa is not enclosed in a cocoon. The imagos appear from May to June and again in August.

Mr. Chambers (Can. Ent. III, 130, 1871) confused this species with *L. acerieIla* Clem., which it in no way resembles.

Lithocolletis agrifoliella sp. nov.

Antennæ pale ocherous, spotted with brown above, the last five spots more widely separated. Palpi yellowish white, dark brown externally. Face yellowish white. Tuft yellowish in the middle, brown at the sides. Thorax reddish ocherous, with a few dark scales on the patagia. Forewings reddish ocherous, somewhat shining. At the basal fourth is a perpendicular white dorsal streak dark margined externally and reaching to the fold. A little farther back is a nearly perpendicularly placed white costal streak, convex outwardly beneath the costa and also attaining the fold, slightly beyond the dorsal streak; it is strongly dark margined externally; its short internal straight dark margin is opposite the external dark margin of the first dorsal streak. Near the base, the costal portion of the wing is of a smoky hue. Placed diagonally across the wing toward the base on a line with the internal edging of the first costal streak are two black transverse spots, the first just above the fold, and the second nearer the base just below the fold; sometimes with a few whitish scales internally. At about the middle of the wing length is a broad oblique costal streak, internally dark margined near the costa, and its external dark dusting continued as the external dusting of a much narrower dorsal streak, whose apex just meets that of the costal. At the angle, the dusting is very dense on a white ground, and is continued backward as a broad band, nearly one-half the breadth of the wing. to a point between the third costal and dorsal streaks The third costal streak, which is sometimes a spot, not touching the costa, is inwardly oblique and externally dark margined. Opposite it is a long oblique dorsal streak, whose external dark margin is continued into the dusted apex, and which usually unites with a sickle-shaped costal streak, lying above the dusted apex, and concave toward the costa. The dark margin of the third costal streak is sometimes continued along the costa to this last streak. Cilia ocherous, with a dark brown hinder marginal line through their middle. Alar expanse 7.5-9 mm. Hindwings gray. with a bluish metallic luster. Cilia fulvous. Abdomen dark bluish metallic above in the male, pale yellowish beneath, with a median line and diagonal marks on each segment dark. In the female with the last two or three segments and tuft ocherous, pale ocherous beneath. and marked as in the male. Legs whitish, the first two pair annulate with black; hind tibiæ shaded with ocherous and black scales, tarsi tipped with black.

Mills College, Alameda County, California.

Described from specimens bred from leaves of *Quercus agrifolia* Nee. received from Mr. G. R. Pilate. The mine is a whitish, somewhat irregular blotch on the upper side of the leaf. The pupa is formed under a flat nearly circular semi-transparent web, the upper epidermis, as is usual, being thrown into a longitudinal fold.

This species is very near to *umbellulariae* Wlsm. The most marked difference is the absence of the costal and dorsal basal white patches characteristic of that species.

Lithocolletis platanoidiella sp. nov

Antennæ whitish, banded with brown above. Palpi shining white Face shining white, with a slight golden lustre Tuft golden Thorax and forewings deep shining ocherous. Extreme edge of the costa toward the base black. The first costal streak at the basal fourth, short, oblique and outwardly dark margined. The second costal streak, at the middle of the wing length, is also oblique, and its apex meets that of the longer corresponding dorsal streak, which begins at the middle of the dorsal margin, somewhat nearer the base than the costal streak There is thus formed an interrupted, angulated white fascia, of which the external dark dusting is continuous, and is prolonged backward to the space between the third costal and the second dorsal streaks These latter streaks are placed opposite to each other, the costal at the apical third, the dorsal at the tornus, and both are dark margined behind Fourth costal streak somewhat oblique, pointing forward, and dark margined behind by a few black scales Apical portion white, dusted with black scales. This dusted portion forms an almost rectangular area At the base of the costal cilia, but not extending through them and anterior to the dusted apex, is a small white streak Marginal line in the cilia brown Cilia ocherous around the apex, becoming gray toward the tornus Alar expanse 6.5-8 mm Hindwings gray Cilia gray, tinged with reddish Abdomen gray above, shining silvery ocherous beneath Anal tuft ocherous. Legs Front legs dark brown above, with a narrow white stripe beneath Tarsi white at their bases Middle and hind legs whitish ocherous, their tarsi tipped with black.

I have bred this species at Cincinnati, O., from blotch mines on the upper surface of leaves of several species of oak, viz *Quercus alba* L., *Quercus macrocarpa* Michx., *Quercus platanoides* (Lam.) The larva is of the flat type, and when mature, spins an oval flat silken cocoon The imagos appear in August The larvae of the fall brood hibernate in silken lined chambers

This species superficially resembles *L. bethunella* Cham., from which it can be distinguished by the absence of the dorsal streak at the basal fourth and by the presence of two costal streaks beyond the fascia, there being but one such streak in *L. bethunella*.

Lithocolletis arcuella sp. nov.

Antennæ whitish, annulate with brown above, tips blackish. Palpi silvery white. Face silvery white, slightly tinged with golden. Tuft yellow, mixed with orange at the sides. Thorax and forewings shining reddish orange, with glistening white markings. There are three costal and three dorsal white spots, the second pair uniting to form a fascia; all black-margined externally. The first costal spot at the basal third is short and broad, its dark margin, passing around its apex, almost encloses it. The first dorsal, almost square, begins nearer the base than the first costal, and extends half way across the wing. A broad white angulated fascia at about the middle, black-margined externally and on the costa internally. Third costal streak strongly arcuate and opposite the more triangular dorsal streak; the external dusting densest immediately behind their apices. Apical portion densely dusted with blackish-brown scales, and bordered internally by an indistinct outwardly concave streak of silvery scales. Marginal line in cilia brownish. Cilia golden, becoming grayish towards the tornus. Alar expanse 10 mm. Hindwings bronzy gray, cilia gray. Abdomen bronzy gray above, silvery beneath. Anal tuft reddish. Legs, except the first pair, ocherous, tarsi whitish and unspotted. First pair striped with dark gray, tarsi banded with gray.

One specimen taken at Mountain Lake, Giles Co., Va., June 20, 1907. A very large and distinctly marked species, belonging to the same group as *L. bethunella,* Cham.

Male Polistes annularis Survive the Winter.

By C. S. Brimley, Raleigh, N. C.

Finding among my pinned wasps some male *Polistes* taken in December and January, I kept notes of all the *Polistes* taken while hibernating during the winter of 1906–7, with the following results:

November 29, 1906. Fifty-four *Polistes* taken, of which twenty were male *annularis* and thirty-one females of the same species; three were females of other species.

December 4, 1906. Fifty-seven taken, of which one was a male *annularis* and the rest females of other species.

February 8, 1907. One hundred and thirteen taken, of which fifty were males and fifty-six females of *annularis* and seven females of other species.

March 22, 1907. Three males and two females of *annularis* taken on the wing. On March 26th two more male *annularis* taken, also on the wing.

Argynnis astarte, Doubl.-Hew., and other High Mountain Butterflies.

By F. H. Wolley Dod, Millarville, Alberta.

In Can. Ent., xl, p. 14, January of the present year, is an article by Dr. Henry Skinner, expressing regret that so few definitely specified localities for *Argynnis astarte* have ever been recorded. As some notes of mine on this and other Alberta species will shortly appear in those pages, I thought I would take the opportunity of dealing more fully with the habitats and habits of some of the high mountaineers of British America in the News. Were I in Dr. Skinner's position of never having "been there before," I suppose I should have felt just the same about the matter, and been quite at a loss, once arrived at one of the C. P. R. hotels in the Canadian Rockies, where, when or how to go to the most likely place to get or even to see *astarte* in the shortest possible time. Yet had I not read his article, I should probably not have troubled to name any exact locality, so confident do I feel that *astarte* could be found in a favorable season upon any peak at or above the timber-line (8000 feet is not necessary) round Banff or Laggan, or the adjacent neighborhood, a few weeks after they were sufficiently bare of the previous winter's snow.

My first acquaintance with the mountain tops was in 1900, when I made the trip from Laggan Station to the nearest mountain to the northeast, as that had been pointed out to me a few years previously by Captain H. J. Elwes, as one which he *thought* Mr. Bean had told him was a good one for butterflies. Mr. Bean's "low, smooth mountain directly north of Laggan" is very likely this, as the station hands told me he used to go and camp high up on it for weeks. His mountain "three miles southwest of Laggan, 8500 feet," is very likely Piran, or St. Piran, as it is called on some maps, of which the latest computed height is 8610 feet. Well, I got there; and just below the summit I got a portion, about half—the central half of an *astarte* ♂. If the rest of him had been anywhere near, it would probably have assisted him better to keep out of my way, and I should not have got him. On the top ridge, a long, even shaly slope, suitable for running hundred-yard races, I saw a few more and caught a fresh though slightly crippled ♂ *Œneis beanii.* Then in went the sun for the day, and the day following brought snow. That was on August 8th. I referred to the locality in Can. Ent., xxxiii, p. 161, as Slate Mountain (I wrote southeast by mistake), as it and its neighbor to the west were marked on the map as "Slate Range," but I have failed to discover whether it has received a definite name even yet. Four days later I took another in even worse condition, on the top ridge of Sulphur Mountain just on the timber line, at about 7200 feet. Mr. Sanson's capture on June 27, 1900, I think the earliest yet recorded, and that near the Devil's Lake, Banff, was recorded by me in the pages referred to.

On July 18, 1904, after having waited round Lake Louise, Laggan, in company with Mrs. Nicholl for two days, waiting for a gleam of sunshine and breath of warm air, and sitting on snow-drifts to try and keep warm, I started alone on another visit to the "Slate Mountain" in most unpromising weather. It did no better than it promised either, and the most interesting thing I found was a pair of ptarmigan with a young brood which, by-the-way, are less afraid of a man than the average barn-door fowls. If anyone contemplates making a trip to that mountain for butterflies and back in a day, my advice is *don't!* It is nearly three miles from Lake Louise to the station, and three more through burnt and fallen timber to the foot of the mountain. There are others far easier of access and probably equally prolific or more so.

On the day following the sky had almost completely cleared, and I piloted Mrs. Nicholl up the trail to Saddle Back, about two miles from Lake Louise chalet. It was there on a grassy and heathery slope that I had taken what I never believe is *Colias streckeri* and which I recorded as *nastes*, and *C. pelidne* var. *skinneri*, and a worn specimen of *Chrysophanus snowi.* But that had been nearly three weeks later, and now the previous winter's snow had evidently not been long off the ground, and there was nothing to be seen. As I had brought Mrs. Nicholl up that height rather against her inclinations, I felt somewhat disgusted. We sat down on a fallen log (we were at about 7000 feet, a little below the limit of timber) and thought. We were in between two peaks, Fairview 8875 feet, according to the map I had consulted, and Saddle Peak 7900 feet. Presently Mrs. Nicholl asked, "Which of these is the most likely peak for *astarte?*" I had been at Laggan before and she had not, so I felt bound to give advice. "That, I fancy," I replied pointing to the top of Fairview, some 1900 feet above us. I had no idea that she intended going up, for the wind was fresh and cold and not a butterfly or moth was to be seen moving. We appeared to be too early by a fortnight for so high an elevation. However, she wandered off in that direction and I still sat and thought.

About an hour later, *i. e.*, at about midday, I espied her close to the summit. I had now made up my mind that we were wasting time up in this windswept, belated region, and tried to signal her to return to much lower levels. I failed to catch her attention, so started off—to fetch her back. I had hardly commenced the ascent when I caught a freshly emerged ♂ *C. skinneri*, that species reaching to barely above the timber line, which at Laggan averages about 7200 feet. I had yet to go within about 500 feet of the summit when whiz! flash! What was that? A red butterfly. *Astarte?* That cannot have had the temerity to emerge from the pupa up here already this wintry season! Mrs. Nicholl will be interested to hear I have seen something reminding me of *astarte*. I hurried up to the peak. The wind had now dropped, or else I had got above it. The huge loose rocks with which the mountain top seemed to be piled up, caught and reflected the sun's heat and I seemed to have reached a different climate. I soon caught sight of Mrs. Nicholl flourishing the net. "Hello! Why didn't you come up long ago? *Astarte* swarms. I've been having grand sport for the last hour." And sure enough, there they were in *dozens!* But how they flew! Now dodging around the rocks, then whiz! Flash! Over cliff or else straight away out of sight as though one had a train to catch, and not another chance for a week. Sometimes two or three would meet and fly almost vertically upwards, gyrating around one another to a height of 50 or 100 feet, then separate and descend still more quickly though less vertically in different directions. Occasionally one would settle on a rock, but if ever I did manage to get within striking distance I generally missed, so quickly do they dodge. It is a great exertion to climb 3000 feet from the hotel to the regions of *astarte*. It is a great sight when there to see *astarte* on the wing, common. But it is a greater feat when seen, to catch it! "Look! there goes one. He's off! There's another. Look! Two! Behind you!" Indeed, at times they seem everywhere at once, and then perhaps ten or fifteen minutes you may not see more than one, passing like a flash. Between us, I think, we got ten in a couple of hours, but then we were paying attention to *Argynnis alberta*, *Oeneis beanii* and *Chrysophanus snowi*, as well, and, the writer especially, had an eye to moths also. *Astarte* is such a brute to catch, and there are several other good things to be had round the peaks, so that exclusive attention to this species during one day's visit does not commend itself. Personally, I was always a great muff with the net, and Mrs. Nicholl more than doubled my catch. It may be that on duller days with intermittent sunshine and lower temperature, this butterfly may be easier to capture. I have had no opportunity of trying.

Oeneis beanii was still more common at the same place. It is decidedly shy of approach, but with extreme caution is not hard to stalk when at rest and does not make long flights. I think we got fifteen or twenty on that day in fine condition, and nearly all males. *Astarte* were also prime, and males exclusively.

A. alberta was just out, and though far less common than the others was much easier to catch. It is not a peak-haunter, preferring even shaly slopes a few hundred feet lower. I saw none on the extreme summit. Castle Crags, or rather the lower ridges leading to them from Fairview, I found good ground for it and an easy footing for quick movements. It is a lazy, slow flier and does not like to rise. It often settles, and from its low-flying habit I have often caught a netful of shale, either instead of or as well as the butterfly. On that day we took about a dozen, both sexes. Later in the day I found *Oeneis beanii* and *astarte* on the wing on Saddle Peak as late as 5 p. m. It should be remembered that the favorite haunts of ♂ *astarte* and *beanii* are either cliffs or gigantic piles of sharp-edged rocks which make running a yard absolutely impossible, and quick movements with one's feet inadvisable, often highly dangerous. This, with the exertion of climbing, the uncertainty of the weather and the fleetness and shyness of *astarte* makes one feel that it is of some value when caught. *Chrysophanus snowi* was also to be had in similar situations to *alberta*. But this species goes below the timber line.

On the following day, in warmer weather, we made the ascent of Piran on the opposite side of Lake Louise. There we found the same four species in equal, if not greater numbers, with the addition of *Melitaea anicia* var. *beanii*. This form goes far above the timber line, but does not reach the summit. The typical *anicia* is found lower down and there appears to be gradations through. This, by-the-way, I had taken on Slate Mountain, as well as *Lycaena aquilo* which flies on Piran also, but above and below timber. Here also we took a few *Colias streckeri* which was just coming out. This on a lower ridge leading toward Mt Victoria. On this ridge running is safe and easy, and *Argynnis alberta*, *Chrysophanus snowi*, *Oeneis beanii*, and occasionally *Lycaena aquilo* are to be found. Such situations are perhaps the best for catching *Oeneis beanii* by reason of the open ground, though more may be seen higher up. For *astarte*, ♂, "Excelsior" must be the motto. This afternoon Mrs. Nicholl took a ♀ down close to the timber line above the head of Lake Agnes and near the same place a ♂ of *Colias elis* just out. Here end all my personal experiences with *alberta* and *astarte*

On July 16th and 18th of last year I had some success with *Oeneis beanii* again on Piran, the first day in dull, cold weather with a few glimpses of sunshine. If the sun appeared for a few seconds, so did *beanii*. I would mark him down, and even if the sun went in again at once I frequently caught him, sometimes in a pill box ! Once I delved down about two feet amongst stones and got him. On the 18th I took two ♀ ♀, one near the summit the other within 200 feet of Lake Agnes, *i. e.*, about [illegible] feet, and quite freshly emerged. I saw the species all over the south and east sides of the mountains from the timber line up

The west side is precipitous. The season was exceptionally late and *astarte* evidently not yet out. *Neoarctia yarrowi* has more than once been taken on Piran, and today I found a half-grown larva on a rock which was probably this species, and several cast skins. The larva refused all food and died. *Melitaea beanii* and *Anthocharis creusa* were other catches, at and just above timber.

On July 7th I ascended Mount Stephen, Field, B. C., up to 7500 feet or a little higher. I took a freshly emerged *yarrowi* ♀ sitting on a rock in blazing hot sunshine. It made no attempt to escape, though its wings were dry. I caught *Œneis beanii* ♂ and saw one or two more. A full-fed larva found several hundred feet above timber produced *Lycaena aquilo* ♂ on July 29th. On the 8th I went up Mount Field by way of Burgess Pass. Here again I took *Oeneis beanii* and saw three or four more. That was on a low spur overlooking the railway, by no means the highest point. Also a full-fed larva which started to spin within four hours and produced a ♂ *yarrowi* on July 29th. He crippled very slightly in drying, not seeming to understand climbing up sticks but wanting *rocks*. The larva was at rest in the hot sun. Today I got a thirty-yard view of a goat, which stood and stared at me but did not allow himself to be caught. On the 13th I made the ascent of a mountain, probably nameless, about six or eight miles southeast of Windermere, B. C., by way of what is locally called "Taggart's Pass." It is timbered practically to the summit, and probably scarcely over 7000 feet. Result, *inter alia*, two or three *Oeneis beanii* seen quite close but not captured. *Pyrgus centaureae*, one in fine condition, several hundred feet lower. This, by-the-way, I have from Lake Agnes, Laggan, much worn, July 17, 1904. In Edward's Butterflies of North America, iii, part xv, Mr. Bean writes: "In 1890 I took one pair of *Arg. alberta* on a mountain near Hector, B. C., two miles west of Alberta Province line. On that mountain lives *Chionobas brucei*, never yet observed at Laggan, only nine miles distant."

Mrs. Nicholl records both *alberta* and *astarte* from Lake O'Hara, B. C., and the Yoho district. Nowhere there, however, did she meet with *Oeneis brucei*, though at my suggestion she was even on the lookout for it. Last year, however, she met with it some way to the north of Laggan. She writes: "The first place I took it was on a mountain at the head of the North Fork of the Saskatchewan flying with *beanii*; it was common on all the high mountains north of that. It is evidently a more northern species than *beanii*, and I think harder to catch." I am indebted to her for a good series. About other species she writes: "I got eleven *astarte* on the spurs of Mount Athabasca, and northwards, very fresh, the last week in July, and *alberta* fairly swarmed in many places. . . . . I got twenty-five in one day on the slopes of Wilcox Peak. . . . Wilcox Pass, or rather the valley just south of it, is the headquarters of *C. elis*, which swarms there, with a few *christina* in company. *Elis* is evidently a northern insect. It is the commonest *Colias* on the Athabasca. One *Pyrgus centaureae* on Brelahtan Pass in August is the only one I got."

Her record for *alberta* during 1907 is particularly interesting, as during six years collecting at Laggan Mr. Bean only met with it in the even-numbered years, and suggested that it was biennial in appearance. It may be at Laggan yet, for all anyone knows, as I have no odd-year records. By-the-way, I found year-old wings of either this or *astarte* in a spider's larder under a stone on Mount Stephen. Two very high mountaineers, though perhaps scarcely worth climbing after, are *Pamphila comma* and *Pieris occidentalis*. I have *comma* (form *manitoba*?) from 8500 feet, and *occidentalis* from the actual summit, over 8600 feet of Mount Piran. I got wildly excited on viewing four or five of the latter species in the distance playing round a high ridge on Mount Field, and thought I had come across a new species.

* * *

On page 84 of the February News, *Elytroleptus floridanus* is said to have been recorded in the East only once before, from Massachusetts. It might be of interest to some, to know that it has been taken abundantly in this vicinity, for the last five years. It is found on oak leaves, the last of May and the first of June.—Norman S. Easton, Fall River, Mass.

Notes on Catocala.

R. R. Rowley, Louisiana, Mo.

My work with Catocala in 1907 began on the 23rd of March, when a batch of eggs of *C. unijuga* that I had received from Mr. C. Leonhard of Kearney, N. J., began hatching prematurely, prompted, no doubt, by the unusually warm weather that prevailed from the 20th to the 28th, the thermometer ranging for a week from 80 to 90 degrees. A few tender leaflings had burst their winter coverings in anticipation of an early spring, but came to grief in the protracted cold weather that followed.

It taxed me to the utmost to get food for the hungry young "crawlers" and I was compelled to keep a fire going in the "bug house" from the last of March to the 8th of May to save the brood.

The freshly hatched larvæ were very slender, span-worm-like, with large, almost black heads.

The first moult took place on March 28th, five days from hatching and the caterpillars changed to black with a cream-colored middorsal band and an almost white ventral side with four or five large, round or square black spots along the middle.

On the 5th and 6th of April the larvæ moulted the second time, reaching a length of three-fourths of an inch with sides dark, mottled with a lighter color. The middorsal line, light, narrow and with a rather large spot of the same color on the segment beyond the third pair of true legs and another above the second pair of prolegs. The venter, cream color. A dorsal hump over the third pair of prolegs.

On the 10th of April the third moult occurred, with the larva nearly an inch long, brownish and grayish in irregular streaks. The dorsal cream colored line reduced to small separated sausage-link-like spots, not very distinct.

The fourth moult occurred on the 16th of April, the larva being a light gray with dorsal hump and dark spot over interspace between the 3rd and 4th pairs of prolegs, with a white lateral patch on either side, just in front of the black dorsal spot. A broad, white cross band just back of the 3rd pair of true legs. Head light gray with a black marginal line down each side and above. The third pair of prolegs as large and prominent as the end props. A row of small, middorsal, rounded, connected white spots with black boundaries. As the larva lies flat on the stem, it furnishes a strong case of protective mimicry.

From April 22nd to 24th the fifth moult occurred. Just after this moult, the larvæ vary in length from one and a half to quite two inches, possessing small, light-colored tubercles, each set with a bristle and the entire body with a lateral fringe of short setæ.

Head much larger; the body a little darker than before but without any black spots. Head with encircling band of black Both true and false legs light. Whole body with light and dark gray longitudinal, irregular stripes or figures.

In the full grown larva the upper lobes of the head inside the black encircling band, yellowish brown. The ground color becomes ashen gray with pale, longitudinal lines, much broken and irregular. The hump over the 1st pair of prolegs quite disappears and the enveloping spot is hardly noticeable. Larva quite two and a half inches long. Between the fifth moult and maturity fifteen of the fifty larvæ died.

The first case or cocoon was spun May the 9th, on the ground between two leaves. Others spun between folds of paper in the breeding jars. The first chrysalids on May 14th or 15th, about an inch and a quarter long, dark brown on dorsal side, red brown on ventral, abdominal rings, a whitish prunescence covering the whole pupa. The first two imagos on June 13th, the length of pupal stage being 33 days. The last imago on June 20th.

Eggs of *Catocala cara* began hatching on the 20th of May. As in *C. unijuga*, the larvæ are very small and slender and exceedingly active. So much so indeed, that nothing short of an air-tight box will prevent their escape. The freshly hatched larva is light brown with somewhat darker head and rear. About one-fifth of an inch long, rapid in movement and much like young span worms. Diameter hardly more than a No. 40 sewing thread.

Larvæ hatched on May 31st, moulted the first time on June 6th. Before second moult the larva becomes very dark, the latter half being practically black, the dorsum of the front half being light brown. On the top side of the body, back of the prolegs, is a yellow, longitudinal stripe. True feet and prolegs black. Head small, not black.

After second moult (June 10th) the larva is nearly half an inch long; a dark, almost black band along the side with a broad middorsal and upper lateral yellow-brown or orange stripe interrupted only at the hump, over the 3rd and 4th prolegs, by a cross black patch. Pro- and true legs straw color. Head dark.

Just after third moult (June 13th) the larva is about three-quarters of an inch long, very light yellowish-brown with very fine, longitudinal lighter lines and deeper yellow-brown at segment edges. The cross band over third pair of prolegs is red-brown and marks the dorsal hump. True and prolegs light brown. Head with black lateral dash to each side.

Just after fourth moult (June 17th) the larva is light yellowish gray with orange tubercles and short bristles. Lateral fringe of setæ. Humped over 2nd pair of prolegs and with larger twin tubercles over the next to the end segment, forming a hump-like ridge. Head light with lateral black stripe and yellow lateral prominence. True and prolegs flesh color. Length one and one-eighth inches.

When fully grown, about two weeks after fifth moult, the larva is over three inches long and marked much as above stated. In the breeding jars the larva usually spins among the willow leaves on the stems, not on the bottom of the jar as do most *Catocala* larvæ. The pupa is large and covered with a whitish prunescence.

During the past two summers, I have kept a close watch for larvæ of *C. cara* on a small willow tree in my back yard and have been rewarded by finding a number of fine caterpillars. Small "worms" were sometimes taken on the underside of dead twigs while two half grown specimens were found on the bark at the base of the tree in the shadow of some drooping raspberry leaves. On the underside of a dead branch of somewhat greater diameter than a lead pencil, two well grown larvæ were found.

After the tree had apparently been robbed of all its caterpillars and several days had passed without finding any, in the folds of a muslin bag tied on a living branch, three mature larvæ were discovered.

A trick was then tried that had proved successful in the search for *Catocala piatrix* larvæ. Sticks or dead branches were leaned against the tree and, in the morning, several larvæ were found on the under side of the sticks.

I am sure that when no shelter is to be found on the tree, the larvæ, after the night's feeding, leave the tree and hide beneath leaves or find other retreats.

I found this so in *C. piatrix* by scattering pasteboard and folds of paper beneath walnut bushes and in the morning securing the larvæ beneath the boards or in the folds of the paper.

Small larvæ of all species of Catocalæ, perhaps, are sometimes found in the bark grooves or cracks and, perhaps, always with the head down and in most cases within three or four feet of the ground. We have never climbed for any but hickory species and then only when the rough loose bark extended beyond reach.

I recall a walnut bush that grew near the edge of a low bank and the water had worn a hole down among the roots I thrust my hand down the hole and felt among the rootlets till I found a fine large *C. piatrix* larva.

On the underside of a willow that had fallen over, a very large *cara* "worm" was discovered near the ground

Beneath the loose bark of shag-bark hickory, larvæ of a number of species of *Catocala* can be easily found and usually near the ground, but sometimes higher if the loose bark extends upward.

On hickory we have taken larvæ of *C. residua*, *C. habilis*, *C. epione* and Mr. E. A. Dodge adds, *palaeogama, vidua, retecta* and *robinsoni.*

It is certain that *viduata, lachrymosa, judith* and other black-winged species feed on hickory and perhaps pecan.

We have found the larvæ of *neogama* on walnut and suspect *nebulosa* has the same food plant.

Our commonest species, *innubens,* feeds on honey locust as does also *illecta.* The latter species was common here in 1900.

Amica and *illia* feed on oak.

The late summer of 1907 proved a good *Catocala* season here and some rarities were taken. *Illecta* was noticeably absent.

On the 9th of August I took an imago each of *Catocala subnata* and *dejecta* and Mr. Ed. Dodge took one *amatrix* and one *judith.* In two seasons there have been but two *amatrix* taken here. *Judith* is always rare. On August 12th, at night Mr. Dodge took one *nuptialis* at bait. I have never yet taken this moth.

The only *nebulosa* taken here last summer, I took on the 18th of August. The season before we took several specimens of this fine moth.

On the 5th of August Mr. Ralph Dodge was fortunate enough to take a fine *cara* with yellow instead of red on the hind wing, a peculiar freak in color.

On the 29th of August Mr. Ed. Dodge took *C. marmorata,* the first ever taken here, a magnificent specimen.

On the 11th of the same month, the writer took the first *viduata* he ever saw here and it was the first and only one taken here this year. From the 1st to the 15th of September many specimens of *vidua* and *robinsoni* were taken, the latter, almost invariably on the bodies of white oak trees.

Specimens of *insolabilis* and *flebilis* were taken in the summer of 1906 but not in 1907.

On the 29th of June, 1906, I took at bait one *consors* and Dodge took one *parta.* Neither have been taken since.

On the 19th of July, 1906, Ralph Rowley took a single specimen of *C. coccinata,* a species rarely taken anywhere.

All in all, the summer of 1907 was an interesting one entomologically, hereabout, despite the unfavorable character of the early part of the season. The time of appearance of all lepidopters was later than the summer before by from a week and a half to three weeks, but when butterflies did put in an appearance they seemed to make up for lost time in numbers. *Papilio cresphontes* and *troilus* were more numerous than they had been for years, while *turnus* and *ajax* were common.

The great moths *Citheronia regalis* and *Eacles imperialis* had their day along with the rest and their horrid (?) larvæ were brought to the *bugman* in paper bags and glass jars for identification, with the query as to just how long a human being would live after being bitten by one of these venomous (?) creatures.

The year 1881 was a great insect year here as the writer now remembers it, and about the middle of June thousands of specimens of *Argynnis idalia* could be seen poised over wild flowers or on the wing in the prairie country west of Vandalia, Mo. Scarcely a dozen specimens of *idalia* have been seen by the writer since.

* * *

Notes on Necrophorus orbicollis Say.

By C. O. Houghton, Newark, Del.

While at work about some peach trees in my back yard late in the evening of May 30, 1906, my attention was attracted to what I at first thought was the stridulation, at close hand, of the plum curculio, *Conotrachelus nenuphar* Hbst. I was about to strike a match to look for curculios on the limbs of one of the peach trees, when I discovered that the noise I had heard was caused by several specimens of *Necrophorus orbicollis* Say, which had congregated about a dead mouse that lay on the ground beneath the tree.

Wishing to learn something of their movements about the mouse, and the cause of the stridulation, I secured a candle, some matches, a box for a seat, and proceeded to investigate It was then about 8 o'clock and the moon was shining. The night was still and the temperature about 60° F.

Just as I was seating myself near the dead mouse a large beetle came flying about the spot, and on knocking it down and securing it I found it to be another specimen of *Necrophorus orbicollis*. While securing this specimen I could plainly hear the others about the mouse and, in addition to the stridulating sounds, others were heard, as though the various individuals were engaged in combat, the mandibles of one grating on the chitinous parts of another; and this is what appeared to be taking place when I lighted my candle.

At that time there were five specimens about the mouse and four of these were fighting, in pairs, close to the carcass. Their purpose was, evidently, to keep each other from reaching the body of the mouse, and to do this they would seize each other with their legs, and apparently their mandibles also, and roll about in a most ludicrous manner, all the time keeping up their stridulating sounds. At intervals they would release their holds upon each other and return to the carcass, only to renew the combat a little later. They did not appear to mind the light much, especially if it was held at a distance of a couple of feet or so. However, one took flight after a short time, possibly owing to the light.

Desirous to know how the stridulating sounds were produced, I seized one of the beetles with a pair of forceps and held it up, and it was easy to see that the sound was produced by a movement of the abdomen, apparently causing the upper surface of one or more of the abdominal segments to rub against the elytra.*

I collected four of the beetles about the mouse—all that I could locate—at 8.20 P.M., and left the carcass for nearly an hour. At 9.10 I again visited the place with my candle, and was somewhat surprised at first to find the mouse gone from the spot where it had lain. I soon located it, however, at a distance of several inches from its former resting place, and found three more of the beetles, which I collected, about it.

My observations for the night closed at 9.50, when I again visited the mouse and secured a single beetle.

---

* Since making these notes, in 1906, the writer has noticed a single reference relative to stridulation in *Necrophorus*, viz., Third Report of the State Entomologist of Missouri, p. 14. where Dr. Riley, in speaking of the stridulating organs of various Coleoptera, says: "In the burying beetles (Necrophoridæ) these rasps are situated on the fifth abdominal joint, and are scraped by the posterior margin of the elytra."

Winged Aphids.

C. W. Woodworth, Southern California Pathological Laboratory, Whittier, Jan. 17th, 1908.

In the course of a study of the cabbage aphis, *Aphis brassicae*, it was noticed that the wilting of the plant resulted in an immediate slowing down of the birth rate. This season has thus far been unusually dry in the southern part of the State, and in almost all fields there have been innumerable cases of evident diminution in the number of aphids without much parasitism or sign of fungus or bacterial diseases. A leaf badly curled and almost entirely covered on one side by the aphids first shows a spontaneous production of young with wing pads. When these young have become full grown they fly away and the leaf becomes ultimately entirely free from the insects, except perhaps the bodies of a few swollen up parasitized individuals that may still remain and the cast skins that sometimes cling to the surface.

There may be some connection between these two observations, since the failure of plant lice to develop wings under more favorable conditions may be due simply to the rapidity of development of the rest of the body. After about one day from the birth of plant lice, those that are to produce wings are clearly distinguishable. Possibly the delay before birth resulting from a partial wilting of the plant, or possibly the shortage of food for the new-born insect may give the wing buds time to begin development and to reach a point where they have an even chance with the other organs of the body.

Professor Clarke has shown* that the common rose aphis, *Siphonophora rosae*, can be made to produce wings in the first generation upon rose cuttings in sand wetted with solutions of magnesium salts, while nothing else tried showed any effect. This is a case where there is no diminution in water supply; either the wing buds were stimulated by the presence of magnesium, or the other parts of the body were retarded. If the latter is true, it would simply fall in line with the suggestion made above.

---

* The Journal of Technology. Vol. 1.

The grape *Phylloxera* (*Phylloxera vastatrix*) produces an abundance of winged individuals in Europe and elsewhere in the United States, but in California winged forms are extremely rare. This possibly corresponds with the high ratio that soda and potash bear to magnesium in our soils.

Mr. O. Butler, of this department, has suggested to me that since winged forms are produced on the finest roots near the surface of the ground, their absence in this State might be better explained by the almost invariable destruction of such roots in this dry climate.

The occasional production of broods of winged *Phylloxera* may be due to variations in the annual rise and fall of alkali, thus affecting the ratio of the different salts near the surface of the ground, thus conforming to the chemical theory of wing production, or the explanation may be that a better moisture condition on such years may permit sub-surface rootlets to live long enough to produce a brood of winged individuals. The reason for the development of winged forms on these upper rootlets may be according to the second explanation, the slow drying out of these parts or their periodical wilting during the summer resulting in a condition comparable with that occurring now in our cabbage fields.

Similar phenomena occur in this region in the case of numerous other species of plant lice. They increase until they reach a point where the leaf will be brought, by their combined attack, to a semi-wilted condition, and then all the young subsequently produced will develop wings. Whole trees are thus sometimes spontaneously freed from plant lice.

It is well known that wing-producing lice develop much more slowly than those that remain wingless. The present suggestion is that a slower development, either immediately before or after birth, is the exciting cause of wing formation.

The foregoing is presented with the hope that others will make observations, the coming season, of evidence of spontaneous wing production and its relation to dry periods or to excessive infestation of the plant.

Further Notes on Alberta Lepidoptera.

By F. H. Wolley Dod, Millarville, Alberta, Canada.

Argynnis monticola Behr.?

I have only a single Banff male that could possibly be associated with this name, and cannot find by what authority I so listed it, as I do not think the specimen has ever been sent away for a name. I much regret that Dr. Skinner records the species from Banff on my authority. Since publishing my list of butterflies in 1901 I have paid no attention to this specimen or its associates until now, though I had ample opportunity of procuring a long series of *rhodope* from British Columbia, where it is common, had I so desired. As it is I have only four males, one from Vancouver, two from the Island, and the fourth from Kaslo. The three coast specimens are much alike, agree with Dr. Holland's description and, allowing for sexual differences, with his figures. The color of secondaries beneath is very dark, the spots yellowish or slightly silvered only, except the marginal row which are distinctly silvered. The Kaslo specimen is slightly smaller, paler in ground color as well as in shading above, has paler secondaries beneath, with no trace of silver on any of the spots, and those on the margin are slightly larger than in the coast specimens. It agrees in these details with Holland's figure (underside) and description of *monticola* except in having more of a rusty red and less of a purplish shading on secondaries. Such slight material forms unstable ground for conjecture, especially as there are not names to fit both forms in the B. C. lists, but the Banff and Kaslo specimens are alike, and certainly suggest a distinct species from the *rhodope* so common in coast collections. Under *rhodope* in the Kootenai lists Dr Dyar mentions that Mr. Cockle had the species standing as *monticola*.

A. halcyone Edw.

I thus listed the species on the authority of Dr Skinner, who has specimens from me and enters the record in Supplement No 1 to his Catalogue. I have now under examination, 12 ♂ and 3 ♀. The ♀ ♀, which I had been unable to compare when writing my former notes, fits Mr Edward's figure to a nicety. Of outside material allied to the local form I have in my collection altogether two dozen specimens received from various localities and collectors under the several names of *halcyone, coronis, chitone, platina* and *snyderi.* Specimens under the last name resemble my No. 8 less than any of the rest. I do not vouch for the correctness of the names, and as localities are perhaps safer than names in speaking of some allied forms of *Argynnis* I will give them in making comparisons. A ♀ from "Oslar, Col." labeled *halcyone* is more lightly marked and shaded above, and has buff band beneath, narrower and darker than any Calgary specimen and marginal row of spots on secondaries smaller. *Coronis* from Glenwood Springs, Col., comes nearer, but like *halcyone* from Oslar differs in being more lightly marked and shaded above. *Chitone* from Yellowstone Park, Wyo., six to seven thousand feet, is very slightly paler above than my palest, but otherwise I can match it exactly. There remain nine specimens received as *platina.* These I have divided in two series, which if not species are at least well marked local races. The first series consists of two males from Beaver Canyon, Idaho, and Stockton, Utah, and a female from Soldier Canyon, Tooele Co., Utah. The first of these is one of the type localities of *platina,* comes from Dr. Barnes and agrees with the description. This series differs from the Calgary species in being slightly paler in all the details of color and shading, but more distinctly in having rather larger silver spots and a wider, buff band. The other series of four males and two females are from the mountains of Colorado above 8,000 feet bearing labels "Pinnacle," "Gore's Range" and "Williams River Range." They are darker and more heavily black-marked and shaded above, and having the spots smaller and buff band narrower than the other series, fit the Calgary species exactly except for size which is very slightly smaller in the males, with the females relatively smaller still.

LINDSAY SYMINGTON of Looe, Cornwall, England, wishes to correspond with a collector wanting British Lepidoptera, with the idea of exchanging British for American species. Specimens set or papered. Full data and names.

A Fossil Orthopterous Insect with the Media and Cubitus Fusing.

By T. D. A. Cockerell.

The first really fine insect found in the miocene shales of Florissant (Colorado) by the expedition of 1906 was a large beautifully spotted Orthopterous wing or tegmen. It was discovered by my wife at Station 9L, and was put aside for detailed study, which it has only recently received. The principal reason why it was not described sooner was its apparent resemblance to *Lythymnetes guttatus* Scudder, and the consequent possibility that it might belong to that species. In August, 1907, however, I went to Cambridge and examined the type of *Lythymnetes guttatus*, finding it to be entirely different from our insect. Later, part of a tegmen of *L. guttatus* was found in unpacking the collections of 1907; it was obtained by Mr. S. A. Rohwer at Station 14. The new form may take the name *Palaeorehnia*, in recognition of Mr. Rehn's important researches upon the Orthoptera.

Palaeorehnia maculata n. g., n. sp.

Tegmen. Exceedingly ample, the portion preserved 39 mm long and about 17 across; the original length must have been over 55 mm. The venation may be compared with that of *Cyrtophyllites rogeri* Opp., from the Jurassic of Bavaria. The subcosta is straight, a trifle arched about its middle, and gives off veins above (three can be seen), more oblique than those of *Cyrtophyllites* (the costal region probably less ample), the radius is practically straight (not kinked in the middle as in *Cyrtophyllites*), and the radial sector leaves it at the smallest angle possible, running alongside of it and diverging very slightly, but at length giving off a branch (the point of origin of this is not visible) which also leaves at a very slight angle; the media, so far as visible, is separate from the radius, but at about 8 mm. from the base it approaches it very closely and probably joins it a mm or so further back; the media gives off two oblique branches below, the first or lower of which (M_1) unites with the anterior branch of the cubitus for a short distance, at the level of and not far from the origin of the other branch; the cubitus, 11 or 12 mm from the base, breaks up into three branches, of which the first bends upward to join the media (M_2), and then leaving it, very soon branches and the upper ramus of the second branch forks again; the second and third branches of the cubitus are gently arched downwards, and appear to reach the margin without forking; the anal veins are three in number, the first two long and strong, not branched, convex above at base, and for the rest of their course gently convex below. The veins, as in *Cyrtophillites*, are crossed by numerous transverse veinlets; these occasionally branch.

The maculation consists of light spots on a ferruginous-brown ground of various degrees of darkness; the spots cluster along the veins, and are conditioned largely by the transverse veinlets. This maculation is very different from that of *Lythymnetes*, in which the spots are mostly round and midway between the principal veins.

Hab.—Florissant; Miocene, Station 9 L (*W. P. Cockerell*, 1906).

The interpretation of the venation of *Palaeorehnia* was not at once evident: the union of the media with the cubitus and its later departure therefrom, is a confusing character, only readily understood by comparison with other types. Curiously this character is present in the ancient and extraordinary insect *Eugereon bockingi* Dohrn., from the Permian. The same character is found in the anterior wings of the Neuropterous *Sialis* and *Raphidia*. Among the fossil Orthoptera the union of the cubitus with the media is found in *Cyrtophyllites rogeri*, an insect with broad tegmina having many points of resemblance to *Palaeorehnia*, together with very important differences. In the ordinary Acridiidae the cubitus bends upwards toward the lower branch of the media and at the point of closest approach there is a cross-nervure. It is perhaps permissible to assume that this indicates descent from a form in which the nervures actually joined. Among the specimens and figures of recent Orthoptera available, I was not able to find any genus in which the media and cubitus fused in the manner of *Palaeorehnia*. Mr. Rehn has very kindly sought for this character among the far better materials at his command, and has found it essentially as in *Palaeorehnia* and *Cyrtophyllites*, in the Phaneropterid genus, *Tetrachoncha* Karsch., 1890. This genus is exclusively African, with four known species. In the Pseudophyllinae Mr. Rehn found tendencies to the same condition in a great number of diverse genera, but in no case true coalescence. In eighteen genera of Phanopterinae he found tendencies similar to those just described for Acridiidae; the character of the cross-vein varying, the approach being very decided in *Ischyra*, and slightly less so in *Philophyllia*. The eighteen genera are as follows: *Elimaea* (Oriental region), *Aniara* (Neotropical), *Hyperophora* (Neotropical), *Ægimia* (Mexico and Central America), *Ancylecha* (Malay region), *Phyglea* (Malay region), *Sympaestria* (Malay region), *Terpnistria* (S. Africa), *Plagiopleura* (Neotropical), *Hyperphrona* (Neotropical), *Prosagoga* (Neotropical), *Pycnopalpa* Neotropical), *Syntechnia* (Neotropical), *Philophyllia* (Neotropical), *Ischyra* (Neotropical), *Posidippus* (Neotropical), *Weissenbornia* (Africa), *Pyrgophylax* (Oriental).

The wide distribution of this tendency, together with the facts already related, would seem to suggest the retention here and there of an originally common character, rather than the parallel development of something new. It seems just possible that Scudder's *Cymatomera maculata* may be *Palaeorehnia*; the reference to *Cymatomera* was wholly provisional. The species was founded on fragments of the base of a tegmen, and perhaps cannot be certainly recognized.

* * *

Two New Species of Eupithecia Curtis.

RICHARD F. PEARSALL.

Of the eastern *Eupithecia* it seems desirable that the types of closely allied species should be retained where they may be accessible for comparison and study in their home region. I venture therefore to offer descriptions of some which I think should be classed as new:

Eupithecia conformata n. sp.

Expanse 14-16 mm. Palpi long, not very stout, soiled white with a few dark gray scales above. Vertex and front grayish white or white with two spots of dark gray below antennæ, and a border line of same above clypeus. Antennæ dark gray annulate. Thorax, pale gray darker in front, whitish centrally and on posterior region. Abdomen above pale gray and brownish scales mixed, whitish at base, on second segment a lunule of brownish scales often absent, tufts not prominent, dark gray, anal segment paler. All wings above, clear pale gray, submarginally darker. Forewings narrow somewhat extended at apex, with three square costal blotches black, the beginning of cross lines, which consist of black dots on the veins more or less distinct. Basal line much broken, beyond it a pale line divided centrally by a fine darker hair line. Median line, also broken, turns from costal blotch toward discal dot, then in waves straight across wing. Extra-discal makes a sharp angle at costa, then rounds out opposite cell, and with slight inward curve reaches inner margin two-thirds out. Beyond this a pale line, strongly angulate at costa, centrally divided by a pale gray hair line, runs parallel with it across wing, succeeded by a gray shade line, more or less distinct which sometimes ends in a dusky spot at anal angle. Submarginal white line much waved, not very clear, and lacks the prominent white double dots of *miserulata* at the anal angle. Hind wings with inner margin showing the inception of five cross lines, those at base darkest, only two of which cross the wing extra-discally enclosing the broad pale line, which is continued from forewings in a curve subparallel with margin. Fringes long, pale gray, darker basally at end of veins. Marginal line obscure, dark gray broadly cut at veins. Discal dot on forewings large, round, prominent black; on hindwings small, obscure. Beneath, a clear silken gray; the discal and extra-discal with its succeeding pale line across all wings. On hind wing, the median line makes a sharp outward angle at cell touching discal dot at its apex Basal line also evident, the entire series of lines composed of dots on veins. Marginal line heavier and discal dots distinct on all wings. Body beneath and legs whitish.

Type— ♂. Big Indian Valley, Catskill Mts., July 1, '06.

Type— ♀. Bronx Park, New York City, June 23, '04, in the collection of R. F. Pearsall.

The species is evidently double brooded, and resembles *miserulata*, but is smaller, the males being easily separable by their slender shortly ciliate antennae, the prominent round discal dots on fore wings, and absence of yellowish scales on thorax and head.

Twenty-four males and females, co-types, taken in Bronx Park, April 25 to May 4, and in Catskill Mountains, July 2 to August 1.

Eupithecia filmata n. sp.

Expanse 17-18 mm. Palpi long, rather stout, dark brown. Vertex and front smooth with yellow brown and white scales mixed. Antennæ pale yellow brown, annulate in the ♂ heavily biciliate. Thorax above dark brown, pale at centre. Abdomen above and beneath, with dark brown and whitish scales mixed, rough; the first segment pale, the second dark brown, tufts black. Forewings broad, somewhat extended at apex, rounded, with inner margin straight. Hindwings broad, rounded, the margin rather straight between veins three and six, all of thin texture and clothed with yellow brown and pale scales, having lines and veins mottled with dark brown, much after the style of *lachrymosa* Hlst., to which it is a close ally. On forewings basal and discal spaces are somewhat darker, separated by a pale line starting from costa about one fourth out in a sharp outward curve, thence straight across wing to inner margin. The extra discal line a little heavier especially at costa than any other, and somewhat diffuse, starts three-fourths out, with a slight outward curve, not angled, around discal dot, thence in a series of small outward scallops crosses to inner margin within anal angle, succeeded by the usual broad pale line running parallel with it. Subterminal space darker, the hair line not clear except at anal angle where it becomes white, ending in geminate dots, emphasized by a cluster of dark scales surrounding them. Marginal line dark brown, cut at veins. Fringes long, ground color of wing, a little darkened opposite veins. Discal dots linear, black. The discal space is sometimes centrally divided by a broad pale line. Starting one half out on costa, which with a sharp outward trend passes *outside* the discal dot thence waved to inner margin. Hindwings with dark triangular basal area, between which and the extra discal line, which is continued from forewings as a diffuse outwardly curved line to inner margin one half from base, is a broad clear space in which is placed the faint discal dot. The pale line following extra discal is more or less evident, partially edged along outer border on both wings by short dashes of dark scales on veins. Subterminal space darkened with marginal line and fringes as in forewings. Beneath, pale yellowish ashen, glossy, with the [illegible] lines above all reproduced, bordered by dusky dotted or diffuse lines, the extra discal heaviest, with black patch at costa. Body and legs pale ashen.

Types ♂ and ♀, *taken in copula*, Big Indian Valley, Catskill Mountains, June [illegible], 1907, and cotypes from Bronx Park and Long Island, in collection of R. F. Pearsall. One [illegible], from Bronx Park is darker, more heavily scaled, but the usual form is pale, with markings more indistinct than the types, especially if rubbed.

◆

Prof. Trevor Kincaid of the University of Washington at Seattle has been selected by Dr. Howard to go over to Japan and organize a system for the collection of the Japanese parasites of the Gypsy Moth [illegible] over in Europe. He expects to have a good time and to do a pile of hard work in the land of the little brown men, and has started in to learn the lingo.

Chaitophorus Testudinatus in America.

By O. W. Oestlund, University, Minn.

In the December number of the News there appeared an interesting article on the dimorph of *Chaitophorus negundinis* Thos., as observed in Colorado by Mr. Bragg. The following notes and corrections may therefore be timely as attention has now been called to this peculiar form in America. I found the same quite abundant on the maples in Minneapolis in 1897, and have since observed it at various places in Minnesota.

Mr. Bragg, it appears, is unaware of Kessler's* paper on the same dimorph, the most complete on the subject. The dimorph was first discovered and described by Thornton† as *Phyllophorus testudinatus,* and by him considered to belong to some undescribed aphid. Balbiani and Signoret‡ later proved its connection with the *Chaitophorus* on the maple, since considered as *Chaitophorus aceris* (L.) Koch, 1854. They also came to the conclusion that the dimorph, after continuing in an unchanged condition for months, at last perishes and comes to nought. Kessler, in the above mentioned article, showed that three distinct species had been included under *Chaitophorus aceris* by authors, quite similar in general appearance but very distinct as to life-history.

A green variety Kessler assigns to the original *Chaitophorus aceris* (L.) Koch., 1854; a brown variety he ascribes to *Chaitophorus testudinatus* (Thorn.) Kessl., 1886; the third variety is described as new under the name *Chaitophorus lyropictus* Kessl., 1886. The first two have a summer generation that remain as larva in an unchanged condition for three months or more, after which they resume active life and pass through the customary moults. As adults they proved to be the sexupara producing the true sexes: the apterous females and winged males. The dimorph of the first differs from the second in wanting the flabellæ and in the body not being flattened.

---

*Kessler, Nova Acta Leop.-Carol. Akad., Vol. 51, pp. 151-178. 1886.

† Thornton, Trans. Micr. Soc. London, Vol. 3. 1852.

‡ Balbiani et Signoret, Comptes rendus Acad. Sci., Vol. 14.

The dimorph of the second species is apparently the same as that found by Mr. Bragg in Colorado and myself in Minnesota. Kessler's figure shows the 22 flabellæ on the abdomen, while Buckton is evidently at fault as to the number in his figure. As our American material appears to agree in all respects with the figures and descriptions of the European, I have for some time held the two to be the same and that it should be known as *Chaitophorus testudinatus* (Thorn.) Kessl., 1880. Kessler's third form has no dimorph, but continues to produce the spuriæ during the summer as usual in the family.

The question if *Chaitophorus negundinis* Thos., 1878, should be considered as a synonym, or if we also have two or more species under one name, may best be left an open question until the life history of our maple *Chaitophorus* is better known than at present.

The fact that the summer generations of the first two remain as larvæ unchanged for three months or more, Kessler considers as a summer sleep or hibernation; in which case it may be better to speak of it as a specialization and not as a degeneration.

An Aphid Feeding on Coccinellid Eggs.

By A. Arsène Girault.

During early June, 1907, I had in confinement a number of pairs of the ladybird *Megilla maculata* DeGeer, in the laboratory at New Richmond, Ohio. Each pair was confined in an ordinary glass tumbler covered with cheesecloth, and every morning a twig of plum, badly infested with an aphid especially common on that food-plant in that vicinity, was introduced to serve as food. These aphids were eaten voraciously by the beetles. The female beetles were occasionally depositing eggs in small batches of about from ten to fifteen, and quite often it was noticed that these eggs failed to hatch. At first this was thought to be due to infertility, although in several instances the egg masses were found to be thickly covered with aphids which had left their wilting or wilted food; besides the pairs of beetles were mating and some of the eggs deposited by them had hatched.

On the morning of June 10th several eggs in a freshly deposited mass were noticed to be shriveled and, as the aphids were then clustered about the others, it was decided to investigate. After careful examination under a lens and low-power microscope it was found that the aphids had inserted their beaks into the eggs and were actually sucking them dry. A winged female and as many as six nymphs were watched thus feeding, each insect completely absorbing the contents of a single egg during the observation. Each egg gradually collapsed.

I believe that this fact has not been recorded; the conditions under which it was observed, namely, those of confinement, must be taken into consideration. Has this anything to do with the fact that coccinellid eggs are seldom or never found in colonies of aphids?

Notes on Some Neuropteroids from Raleigh, N. C.

By C. S. Brimley.

I. Chauliodes.

On April 4, 1906, I found some *Chauliodes* larvae preparing to pupate under the bark of rotten and soggy stumps near a marsh. All had the respiratory tubes on the eighth segment, close together and unequal in length. I put them in a jar with some damp, rotten wood, and most of them pupated.

From the pupae emerged big, gray *Chauliodes*, of which one which emerged on April 21st and another on May 4th were *C. pectinicornis* by the antennae; the rest, of which one emerged on April 20th, five on April 21st, and two on April 22d, were all *C. rastricornis* judging by the antennae.

On April 22d, 1907, I found another lot of larvae in the same locality and in similar situations to the others. All had respiratory tubes close together and unequal, and appendages on the tenth segment extending beyond the claws of that segment. From these nine adults were bred, a *rastricornis* on May 15th and eight *pectinicornis*, one on May 15th, one on May 17th, four on May 19th, and two on May 20th. I have also taken two *pectinicornis* on sugar.

II. Neuronia semifasciata.

While sugaring for moths in my yard in 1905, I took, on July 8th, a caddis fly apparently attracted by the sugar: next year I took another also in July, and, like the previous specimen, belonging to this species. In 1907 I started sugaring earlier, and got ten of this species between May 5th and June 16th. I also took a specimen at Lake Ellis on sugar on May 5th.

Other Neuropteroids taken at sugar have been two *Chauliodes pectinicornis* in July, 1905 and 1906; two *Allochrysa virginica*, one each on September 21, 1905, and September 1, 1906, and two *Chrysopa lateralis* on August 25 and September 1, 1906.

North Carolina Records of Odonata for 1906 and 1907.

By C. S. Brimley.

Progomphus obscurus Ramb. Lake Ellis, one May 16, 1906. Southern Pines, one received from Manee without date

Gomphus exilis Selys. Lake Ellis, common May 8–18, 1906, and May 22–28, 1907.

Gomphus sordidus Hagen. Havelock, May 9, 1901, and May 25, 1907.

Boyeria vinosa Say. Enfield, one taken by Woglum, July 5, 1906 Raleigh, one caught in State Museum after dusk by the night watchman.

Nasiaeschna pentacantha Ramb. One taken at Raleigh, July 10, 1907 flying over the very same pool where I caught my first in 1902

Coryphaeschna ingens Ramb. Lake Ellis. I took a female in the act of ovipositing May 16, 1906. Another was taken May 28 1907

Aeshna constricta Say. Highlands, three males and two females taken by Herman and Woglum, September 6–9, 1906. Raleigh not uncommon from mid-September to mid-November.

**Cordulegaster fasciatus* Rambur. Highlands, one male taken by Woglum, first week in September, 1906.

Tetragoneuria semiaquea Burm. Lake Ellis, common, May 7–18, 1906 and May 23–28, 1907.

Tetragoneuria complanata Ramb Southern Pines, two, April 8, 1907, one April 17, 1906, all taken by Manee

Somatochlora filosa Hagen. Raleigh, September 6–12, 1906, both females Southport, male and female, late October, 1906; taken by Sherman. Southern Pines, female taken by Manee, August 5, 1907.

Somatochlora tenebrosa Say. Highlands, a male and two females taken by Sherman and Woglum, September 6-9, 1906. Raleigh, a female bred from nymph June 25, 1907.

**Nannothemis bella* Uhler. Southern Pines, May 30, June 11, 22, 1906; June 22, 1907; a number taken by Manee.

Sympetrum vicinum Hagen. Raleigh, taken up to December 13 in 1906.

Libellula basalis Say. Hendersonville, one taken by Sherman in June, 1907.

Libellula flavida Ramb. Southern Pines, June 6, 1906, one taken by Woglum; May 30, 1906 and May 28, 1907, taken by Manee.

Libellula exusta deplanata Hagen. Lake Ellis, May 8-18, 1906; not uncommon. Southern Pines, April and May, 1906, and 1907 several taken by Manee.

**Diplacodes minusculum* Ramb. Lake Ellis, two taken May 24, 1907. Southern Pines, taken by Manee, June 21, 1907.

Calopteryx dimidiata Burm. Lake Ellis, May 17-18, 1906, common on canal near camp. May 23-28, 1907, a few. Southern Pines, June 11, 1906, two.

Lestes vigilax Hagen. Lake Ellis, May 15, 1906, two taken.

Argia fumipennis Burm. Lake Ellis. Abundant May 7-18, 1906 and May 23-28, 1907.

**Enallagma pollutum* Hagen. Lake Ellis, May 15, 1906, one.

" *laterale* Morse. Lake Ellis, three specimens, May 8-18, 1906.

" *divagans* Selys. Lake Ellis, common in May, 1906, and May, 1907.

" *signatum* Hagen. Lake Ellis, two taken May 7-18, 1906.

" *aspersum* Hagen. Lillington, one taken by Neethling, June 8, 1906.

◆

TERIAS MEXICANA BDV. IN NORTHERN COLORADO.—I can add another record of this species from Northern Colorado. In a collection of Lepidoptera collected by Mr. E. H. Richardson last summer, I found three rather battered specimens of *mexicana*. They were labeled, "Easley's ranch, dry creek above Paul Lewis ranch, Chimney Gulch above Golden as far up as the willow spring." They were taken on July 15. Maynard (N. Am. Butterflies, p. 43) gives the following distribution: "Mexico, Texas, Arizona, Southern California and Texas, also rarely to Nebraska, Iowa, Illinois, Wisconsin, and Ontario (Point Pelee), appears to be extending its range north and east." I have received it commonly from San Antonio, Texas.—C. R. COOLIDGE.

---

* The species marked with a * have not previously been recorded from the State. Most of the Southern Pines records are from specimens taken by Rev. A. H. Manee.

The Abnormal Appearance of External Wing-buds in Larvae of Holometabolous Insects.

By Wm. A. Riley, Ithaca, N. Y.

The literature of entomology abounds in reported instances of insectan malformations varying all the way from slight abnormalities in venation or in the segments of an antenna, to duplication of appendages, or to those striking monstrosities in which the head of the larva is preserved by the imago. When we consider the minute scrutiny of the systematists it is not surprising that the vast majority of these instances relate to adult insects. It is to another type of abnormality—the appearance of external wing-buds in the larval stage—that I wish to call attention.

It is a well known fact that the wings of insects with complete metamorphosis are developed as internal invaginations during the larval stage and normally become visible externally only at the time of pupation. So far as I know the recorded cases of abnormalities in which the wing-pads are external in the larva all relate to two species of Coleoptera.—*Tenebrio molitor* and *Anthrenus varius.*[*] To these may now be added a third, that of the Pyrochroid, *Dendroides canadensis* Latr.

In 1896, while experimenting with meal-worms (*Tenebrio molitor*), Heymons[†] found a full-grown larva which possessed a pair of peculiar appendages on the meso- and metathorax. These appendages were symmetrical, those on the mesothorax being somewhat larger than those on the metathorax. Closer examination showed that they were not lateral or dorsal excresences but true wing-pads occupying positions exactly similar to those of the wing-cases of the *Tenebrio* pupa. Since this larva was observed Professor Heymons has been able to find a number of larvæ of the same species presenting the same anomaly, and at the recent Zoological Congress at Boston he exhibited several such specimens.

---

[*] I except the remarkable cases, reported by Cesare Majoli, 1813, of silk worm larvæ which, instead of forming cocoons after the fourth molt, developed wings and other structures of the adult. From the meager accounts available (Stannius '35, Hagen '72) it seems to me that we here have to do rather with abnormal adults which have preserved larval characteristics. To be sure, the line between the two types is rather arbitrary and it is greatly to be hoped that in the future any instances similar to those recorded by Majoli will be carefully and fully reported.

[†] Heymons, R. '96. Flugelbildung bei der Larve von *Tenebrio molitor*. SB Ges. naturf., Berlin, 1896, pp. 142-144. Also in Ent. Rec. xi, pp. 67-68.

Soon after the appearance of Heymon's first note, Mr. Busck exhibited before the Entomological Society of Washington,‡ six larvæ of the Dermestid, *Anthrenus varius,* each of which showed well marked wing-pads on the second and third thoracic segments.

In the summer of 1902 one of our students, Mr. P. B. Powell, who was breeding large numbers of Coleopterous larvæ, discovered the phenomenon in the case of one of a number of larvæ of a common Pyrochroid, *Dendroides canadensis.* This specimen showed the hinder pair of pads the larger while the contrary was true of the cases reported by Heymons. The larva was apparently in the last stage, and exhibited various other abnormalities which will be referred to later.

At first sight it seems strange that all of the individuals presenting this peculiarity are coleopterous larvæ but this is readily explicable when we consider the anatomical relations of the developing wings in this group. The best known type of wing development among holometabolous insects is what Tower has designed the "enclosed type" (the *Pieris* type of Gonin). In this the wing-bud invaginates and finally comes to lie in a closed sac connected with the body wall by a short, slender peduncle. Thus it lies wholly within the body cavity. On the other hand, the researches of Tower, '03, Powell, '04, and others, have shown that in Coleoptera the dominant type of wing development is that which Tower has designated the "simple type." Here as in the heterometabolous forms the wing rudiment is 'not sharply marked off from the body hypodermis and is usually directly evaginated to form the imaginal organ.' Thus it is a comparatively easy step to the abnormality of a free, external wing-pad, whereas such a condition would be much more abnormal with the enclosed type of the Neuroptera and Lepidoptera or the still more highly specialized stalked type characteristic of the higher Diptera.

---

‡Busck, Aug. '97. Larvæ of *Anthrenus varius,* showing wing pads. Proc. Ent. Soc. Wash. iv, p. 123.

Intermediate between the simple and the enclosed types is the "recessed type" of Tower (the *Corethra* type of Gonin). As defined by the former, here "the fundament is invaginated and then evaginated, and so lies in a hollow niche in the hypodermal wall, but opens broadly against the cuticula." This type he found in the Scarabæidæ among the Coleoptera while Weismann, '66, had reported it for *Corethra, Simulium*, and other nematocerous Diptera. Thus it is possible that specimens of these forms may be found in which the buds are free on the surface, though no such instances have been reported.

As to the significance of the monstrosities under consideration there have been advanced two views.

According to the one interpretation the occurrence of the external wing-pads in the larva is to be regarded as an instance of atavism a harking-back to a period when the larva bore wings.

The second interpretation, that favored by Heymons, is that in these cases we have illustration of anticipatory monstrosities[‡] a kind of premature development in which characters normally present in the pupal state are present abnormally in the larva. He supports this view by citing other abnormalities present in his specimens.

That the latter interpretation is the correct one is strongly supported by Mr. Powell's specimen. The most striking evidence is afforded by the fact that in addition to the usual lar-

---

[‡] This instance and several very striking cases of anticipatory monstrosities in lepidopterous larvæ (prematurely developed imaginal antennae, maxillae, and legs) have been very fully discussed by H. J. Kolbe (Allg. Z. f. Ent., 1903, pp. 1, 9, 25, 40), who proposes for the phenomenon the term "prothetaly." τελος completion, προθεω to run before

val ocelli the compound eyes of the adult are partially developed. Moreover, as in some of the *Tenebrio* larvæ there are present more antennal segments than in the normal larvæ, an approach to the condition of the adult. Certain other abnormalities whose significance is not clear, were noted by Mr. Powell. I am under obligations to him for permission to use the data relative to his specimen, but it is to be hoped that he may return to his studies and present a fuller account of this interesting abnormality.

◆

TWO WORKSHOP NOTES.—In examining dried specimens of insects and in "posing" them for photographing it is often desirable to change the position of a wing, leg or antenna without disturbing other parts and without waiting to soften the whole specimen in a moist chamber. This may be done with larger insects by the use of a small camel's hair brush and boiling water. The brush, placed in the water, takes up a small drop which may be applied directly to the joint or part to be softened. A few rapid passes of the brush from the water to the part are sufficient, but it is desirable to have the specimen but a few inches from the water to prevent the drop from cooling. A small dish of water on a tripod heated by an alcohol lamp is convenient for this purpose. Parts moved in this way become fixed again as soon as dry.

The compound microscope with low powers is often used in place of the hand lense in examining pinned specimens. While in rapid work it is more convenient to simply hold the pin in the fingers, steadying the hand on the stage of the microscope, it is frequently the case that a longer or more careful examination is desirable. For holding specimens under the compound microscope the writer uses an ordinary tapering cork stopper fastened to a microscopical slide at about one-fourth the distance from one end. Canada balsam may be used for fastening the cork to the glass. Heat a drop of balsam on the slide long enough to make it brittle when cold, and while still warm press the large end of the cork into the balsam and allow to cool. Where a mechanical device for moving slides on the stage, such as is made by the Spencer Lens Co. or the Bausch & Lomb Optical Co., is in use, the slide may be placed in the clamps of the attachment and the specimen, pinned to the side of the cork, may be moved with precision.—R. A. COOLEY, Bozeman, Montana.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MARCH, 1908.

At the present time it is possible to have made excellent illustrations of insects by the half-tone process or by line engraving, provided the copy or drawings are good and properly prepared. For many purposes a line cut is just as good as a half-tone and costs very much less. We frequently have sent to us copy for plates that is troublesome or not suitable, because some authors do not know anything about the methods of reproduction of plate copy. Copy for line engraving should consist *of lines and dots only* and the ink used should be the *blackest* the artist can procure. If a number of small drawings are made for line engraving, make them so that they can be assembled into a single plate, or draw them all on one card. If blocked separately, it adds enormously to the cost. The half-tone is used for wash drawings and the reproduction of photographs. Always remember that everything shows in a half-tone and that the outlines of many figures are such that the plate cannot be tooled, or routed, or outlined. We get copy consisting of line and dot work and wash drawing and photographs mixed and this necessitates making a half-tone, whereas, if kept separate, both processes could be used separately at less expense. If you make small sketches on separate cards, bear in mind that if assembled, the reduction must be the same for all of them, therefore make them with this in view. It is always a good plan to have the drawings or photographs larger than the size of the resulting plate.

We give some examples of the different processes and kinds of plates:

Plate V, Feb. '08, is a half-tone.

Plate I, Jan. '08, is a mixed plate, Fig. B, being a half-tone, had to be inserted; the other figures are line engravings.

Plate II and III, Jan. '08, are line engravings.

Plate XIII, Oct. '07, is a routed or outlined half-tone.

Plates XV and XVI, Dec. '07, are line engravings.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

PROF. JOHN B. SMITH is getting some very interesting points for his paper on Homoptera. The older species have been badly mixed in collections. Anyone having material should send it to him.

Digby, February 5, 1908.

IN ENTOMOLOGICAL NEWS you sometimes refer to hanging cocoons of *polyphemus*. I have found about thirty of these this winter, a few on low blueberry, and the rest on birch. When on the birch the cocoon was always at the very tip of the twig, and was enwrapped by the three or four end leaves. The silk was spun up the stems of the leaves and then around the twig, but so little was used that a slight pull or a sharp shake would bring the cocoon off. When on blueberry it was surrounded by leaves and generally attached to two or three of the upright twigs. In no cases were the cocoons more than a foot from the ground.—JOHN RUSSELL, Digby, N. S.

AN INTERESTING letter has been received from the Rev. Henry C. McCook, D. D., dated Brookcamp, Devon, Pa.

"I have been ill in bed for five weeks and am just beginning to get about. I did not see until now the honor which had been conferred upon me by the newly formed society of American entomologists in electing me an Honorary Fellow. I appreciate the honor and now beg through you to return cordial thanks for the same. At my advanced age and in my state of health no serious original work is possible. The future, which is most promising, is with younger entomologists, and they seem to be measuring well up to their opportunities. Yet

I continue to do something in the way of interpreting the natural history of our "little brothers" to the thinking people. I am now putting the finishing touches upon another book—'Ant Communes, and How They are Governed.'"

Doings of Societies.

At the regular monthly meeting of the Brooklyn Entomological Society, held on December 5th, 1907, the President, Dr. Zabriskie presided and fifteen members were present.

Prof. Smith spoke upon the habits and peculiarities of the larvæ of *Culex perturbans*.

Mr. Franck exhibited an exceptionally fine melanic form of *Colias philodice* captured at Bethlehem, Pa., in August 1907.

Mr. Davis exhibited a specimen of *Basilarchia* intermediate between *arthemis* and *proserpina*.

Mr. Pearsall, who exhibited a series of *Basilarchia proserpina* as well as a number of other lepidopterous insects from the Catskill mountains, remarked that in his opinion *proserpina* is a good species. He thinks the larva feeds on apple. Mr Franck has found the larva of *arthemis* in the Catskills feeding on wild cherry (*Prunus pennsylvanicus*) and Mr. Engelhardt secured a specimen in the same region, newly hatched from a chrysalid suspended from a willow branch.

A series of *Pieris napi*, both spring and summer forms, shown by Mr. Pearsall, was obtained from chrysalides from larvæ found feeding on crinkle root (*Dentaria diphylla*).

GEO. P. ENGELHARDT,
Recording Secretary

JOSEPH THOMAS.

Died at Quakertown, Pa., Tuesday, January 28, Dr. Joseph Thomas, in his 80th year.

Dr. Thomas was one of the leading citizens of his town and a subscriber to the News for many years He took a great interest in Entomology and in natural history in general.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Lepidoptera for exchange. Would like Californian species not in my collection.—Erval J. Newcomer, Palo Alto, Cal.

Wanted for cash or exchange.—Large and showy North American insects of *all orders*, beneficial and noxious insects, specimens illustrating life histories.—Write to Dept. Natural Science, The Kny-Scheerer Co., 225–233 Fourth Ave., New York.

Wanted for cash or exchange.—Bull. U. S. Div. of Ento. (old series), Nos. 1, 5, 10, 26, 33. J. A. Lintner's New York Reports, Nos. 3 and 13, Illinois Reports, Nos. 14 and 20, Missouri Reports, Nos. 7 and 9.—E. F. Hitchings, Waterville, Maine.

Luna Cocoons.—I have a number of living *luna* pupae of other North American Lepidoptera or papered Lepidoptera new to my collection.—B. R. Bales, M.D., Circleville, Ohio.

I have pupae of *Lapara coniferarum* and *Cith. regalis* to exchange for *Theclas, Lycaena* and *Chrysophanus* not in my collection.—H. H. Brehme, 74 13th Ave., Newark, N. J.

I have pupae of *Papilio turnus* and *cresphontes*, *Sphinx luscitiosa*, *chersis*, *Ampellophaga myron*, *Triptogon modesta*, *Paonias myops*, *Smerinthus germinatus*, *Ceratomia undulosa* and *P. guinquenmaculata*. Want other pupae ,in exchange.—John Kytlica, 1347 So. Scoville Ave., Oak Park, Illinois.

Geometridae wanted, named or unnamed, particularly from the Northwest, Arizona, Montana, Idaho, North Carolina, Texas and Florida. Write first giving quantity and price. Will buy or exchange. Wm. H. Broadwell, 209 Plane St., Newark, N. J.

Would like to exchange 80 named species, many specimens of European Coleoptera (many nice sp. Carabus, Calosoma, etc.), for 50 named sp. of Coleoptera from western states.—C. Harnach, 527 W. 16th Street, Chicago, Ill.

A few pairs of that interesting beetle *Ignotus aenigmaticus* Slosson for any of the following Cremastochilus 5913, 5915, 5916, 5917, 5918, 5919, 5921, 2924, 5928.—L. H. Joutel, 164 E. 117th St., New York,, N. Y.

Cocoons of *T. Polyphemus* and *Samia promethea* to exchange for *Samia cynthia Attacus crizaba* or others.—J. J. Henneberger, 10114 Ewing Ave., Cnicago, Ill.

Wanted. North American Diurnals, Spingidæ and Catocalæ. Offer in exchange large variety of European Lepidoptera.—J. McDunnough, Berlin, W. 30, Motzsh 6, Germany.

Wanted. Named or unnamed Elateridae and Buprestidae from all parts of North America. Will give named Coleoptera in exchange.—C. O. Houghton, Delaware College, Newark, Delaware.

I wish to exchange Chrysalids of *E. imperialis*, *P. ajax. troilus*, *turnus*, *D. hylaeus* and many others for exotic material.—G. H. Hosenfelt, 3656 Salena St., St. Louis, Mo.

Pupae of *Papilio ajax and troilus* for exchange, also a few specimens of *Anthocharis Pima and Stella*, from Arizona, Imagos.—N. Weil, Calhoun, Ky.

Lepidoptera for exchange from 1907 with data and identified. Also chrysalids of *P. turnus*, *cresphontes* and *troilus*.—F. Malkmus, 4398½ Tibson St., St. Louis, Mo.

Will collect in any order and supply European material in exchange for Lepidoptera, especially cocoons and pupae.—J. W. H. Harrison, 181 Abingdon Rd., Middlesboro, England.

Luna Cocoons.—I have a number of living Luna pupae to exchange for other living pupae or papered Lepidoptera new to my collection. B. R. Bales, M. D., Circleville, Ohio.

Will exchange living pupae of *E. imperialis, P. ajax, troilus, turnus, D. hylaeus* and many others for exotic material.—Geo. H. [illegible], 3656 Salena St., St. Louis, Mo.

Wanted, the coming season for cash or exchange, a large number of living pupae, strong and healthy, of all Diurnal Lepidoptera and Noctua (*Papilios, Actias, Attacus*), etc. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

I desire to buy original collections of beetles from North, South or Central America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk C., Brookline, Mass.

Wanted. A large number of all species of *Plusiotis, Phanaeus* [illegible], *Derobrachus geminatus, Strategus julianus, Dynastes granti, Tetracha carolina, Pasimachus mexicanus*, all species of Cicindelidae and all other big beetles (Coleoptera) for cash or exchange. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

The undersigned, with a view of making as complete a State list as possible, desires to communicate with anyone who has collected Michigan butterflies or made notes upon the same. All such are asked to write Dr. W. W. Newcomb, 347 Trumbull Ave., Detroit, Mich.

Coleoptera for Exchange. Canadian Coleoptera in papers, in every family, for North American ones. List sent on demand. Also a large number of exotic Coleoptera.—J. A. Jean, C. S. V., Ville St. Louis, Montreal, Canada.

Indian Insects in all orders. Specimens of *P. mayo, Kallima* [illegible], *Hestia* [illegible], etc., from Andaman Islands, and *T. imperialis, A.* [illegible], *Phyllium, Phasmids* and live cocoons from Darjeeling and Assam.—A. Meik, 4 Convent Road, Entally, Calcutta.

Lepidoptera. I would like to correspond with those who expect to collect for cash in new and little known regions, South and West during the coming season. John L. Healy, 312 City Hall, Chicago, Ill.

Coleoptera. Nine double boxes containing named beetles to exchange for perfect Japanese gold fish. Aug. Schmidt, 515 E. Russell Street, Philadelphia, Pa.

FOR SALE. COMPLETE SET OF EDWARDS' BUTTERFLIES
Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

1,000 PIN-LABELS, TWENTY CENTS
[illegible]
C. V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.
[illegible]

LEPIDOPTERA. I would like to correspond with those who expect to collect for cash in new and little known regions, South and West, during the coming season.

JOHN L. HEALY, 312 CITY HALL, CHICAGO, ILLINOIS.

FOR SALE

The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, .25; *C. arizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. hornii*, .50; *Pasimachus mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. arizonicus*, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Monilema gigas*, .40; *Oncideres tessellatus*, .75; *Leptostylus yuccæ*, 50.; *Urodera crucifera*, 20; *Nodonota arizonica*, .25. Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus epigona*, .50; *Oxycnemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia alata*, .40; *Spragueia plumbifimbriatus*, 25; *Hatima zethus*, .75; *Triprocris rata*, .30; *Gingla latercula*, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North American insects of all orders for sale, or exchange furnished on application.

F. H. SNOW - - - LAWRENCE, KANSAS

The Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,

6, Gunterstone Road, West Kensington, London, W.

Cat. No. 17 for 1908 (now ready) mailed free on demand.

The only dealers' list giving authors' names throughout. 100 named specimens, 1 qual: ex Assam, 40 different species in papers, including *Papilio bootes, gyas*, etc., mailed free on receipt of Post Office Order $4.00 Explanatory Catalogue, with over 300 descriptions and many interesting notes 12 cents.

PARCELS SENT ON APPROVAL FOR SELECTION.

LIVING COCOONS AND CHRYSALIDS

Papilio zolicaon 20c., ajax 12½c., turnus 10c., troilus 10c., philenor 12½c., asterias 10c.; Eudamus tityrus 5c.; Hemaris thysbe 12c.; Sphinx kalmiae 50c., luscitiosa 40c., chersis 50c., plebeia 25c., D. hylaeus 20c,, Cer. undulosa 15c., Triptogen modesta 50c.; P. excaecatus 15c.; Eudryas unio 5c.; Euch. egle 5c.; Euclea querceti 8c.; Apatelodes torrefacta 5c.; Dat. ministra 5c.; S. cynthia 2c.; A. promethea 3c., angulifera 50c., cecropia 3 , luna 20c,, polyphemus 7c.; Ant. io 8c.; E. imperialis 12c.; Cith. regalis 60.; Anis. stigma 8c., senatoria 7c., virginiensis 15.; D. rubicunda 10c. Reduction if taken in numbers.

Morpho specimens in perfect condition expanded.—Morpho cypris $1.00 to $1.50; sulkowskyi $1.25 to $1.75; godarti, a large opal morpho, ♂, $3.00 to $6.00; ♀, $5.00; amathonte $1.00 to $1.50. Prices according to size and beauty.

O. FULDA, 816 Broadway, New York

FOR SALE:—PSYCHE Complete to end of Thirteenth Vol. (1906). A fine set, bound in morocco, with the exception of last two volumes. Price $50. for the set.

PHILIP LAURENT, 31 East Mt. Airy Avenue, Philadelphia, Pa.

The Butterflies of the West Coast

A new book. Text, descriptive and critical, of all known species, illustrated with thirty-two full page plates in best modern photographic color work, with nearly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practically out of print; is not in any dealers' stock, and only a few copies now remain in the author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAST

An abridgement of the above, consisting of the full set of plates as issued in that book, with names of all species printed on pages facing the plates, but with no descriptive text; issued as the best possible substitute for that more expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book address the author.

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

WILLIAM J. GERHARD

SCIENTIFIC BOOKS

2209 CALLOWHILL STREET
PHILADELPHIA, PA., U. S. A.

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia. 6 vols. 1861-67. Complete. Half morocco. Scarce $50.00

—Same. A copy in original parts, lacking vol. ii, No. 3 . . . . . $45.00

Strecker, H. Lepidoptera Rhopaloceres and Heteroceres, etc. 15 parts and 4 supplements. 4 to. 1872-1900. 15 colored plates. Scarce. $40.00

Say. Complete writings of Thomas Say on the Entomology of North America. Edited by J. L. LeConte. 2 vols. 1859. Cloth. 54 col. pls. $16.00

Saussure, H. de. Etudes sur la famille des Vespides. I. Guepes solitaires ou de la tribu des Eumeniens. 1852. 22 colored plates $5.00

II. Guepes sociales ou de la tribu des Vespiens. 1853. 37 col. pls. $7.50

III. Monographie des Masariens. 1856. Lacks plates. $2.50

Muller, H. Befruchtung der Blumen durch Insekten. 1873. With, Weitere Beobachtungen, 3 parts. 1879-82. . . . . $3.50

JOURNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

ditor, E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec. Asso. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rogue, Louisiana

Advisory Board L. O. Howard, S. A. Forbes, James Fletcher, H. A. Morgan, Herbert Osborn, H. T. Fernald

A bi-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

Terms of Subscription:—In the United States, Cuba and Mexico, two dollars annually in advance; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

OURNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

FOR SALE

eports N. Y. State Entomologist; Nos. 1 to 14 inclusive (Nos. 1 to 12 are Lintners); 13 and 14 are Felt's). Sold together for $10.

eports Ills. State Entomologist; Nos. 4 and 5 (LeBaron), $1.50; 6, 7, 8 and 9 (Thomas), $3.00; 16 to 22 inclusive (Forbes), $5. Sold separately as grouped and priced, or the whole lot for $8.50. Address

VERNON L. KELLOGG, Stanford University, California.

SPECIAL OFFER

ifty American Sphingidae, mounted; 30 different species (inclusive **Pholus linnei, Ph. rustica, Sph. kalmiae, Mar. modesta, Prot. ochus**, etc.	$10.00
apilio biomei, India, in paper	1.20
" " mounted, incl. box	1.50
rctonotus lucidus, Calif., in paper, each	4.50
episesia ulalumae, on pins, each	2.75
upae of **Cal. angulifera** . . . per dozen	4.00

THE KNY-SCHEERER CO.

Dept. of Natural Science, 404 West 27th Street, New York

NOVA SCOTIAN LEPIDOPTERA.

Beautifully Mounted, in very fine condition, fully named and dated.

specimens of 200 species, Catalogue value $65.00	**$40.00**
" 100 "	**30.00**
" 100 "	**10.00**
" European Lepidoptera, on pins	**5.00**

2500 specimens, Nova Scotian, to choose from. Expressage extra.

OHN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER C

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YORK.

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.
K.-S. Section Cabinets.
Schmitt Insect Boxes.
K.-S. Lepidoptera Boxes,
and Duplicate Boxes.
K.-S. Screw Handle and
Nets.
The Asta Insect Pins:
White, 60c. per 1000.
Black, 70c. per 1000.

Catalogue II, Entomological
Application.

THE KNY-SCHEERER CO

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect condition.
Single specimens and collections illustrating mimicry, protective
dimorphism, collections of representatives of the different orders of insects,
Series of specimens illustrating insect life, color variation, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect
Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

P. C. Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

APRIL, 1908.

ENTOMOLOGICAL NEWS

Stanford University Library
APR 8 1908

Vol. XIX. No. 4

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor

ADVISORY COMMITTEE:
EZRA T. CRESSON, HENRY L. VIERECK, J. A. G. REHN.
PHILIP LAURENT, WILLIAM J. FOX, H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September**, in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.
Outside of the United States and Canada, $1.20.
SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

☞ **All remittances should be addressed to ENTOMOLOGICAL NEWS, Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.**

NEW ARRIVALS.

Having received a large shipment of Lepidoptera from Assam and Upper Burma, containing Papilios and other desirable species, including several varieties of Saturnidæ, which will be sold at very reasonable prices

50 perfect specimens in papers, containing many Papilios, including *Papilio paris, Papilio helenus*, and many other desirable species; fifty different specimens; no duplicates. **$5.00**

ONE DOZEN PAPILIOS, ALL PERFECT $2.25

Other rare specimens at reasonable prices.
Send for list and prices.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA.

ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in botany, especially cactii and herpetology—reptiles and amphibians if notified early in the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th St., New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSECTS
(EXCEPT ODONATA)

OF THE UNITED STATES

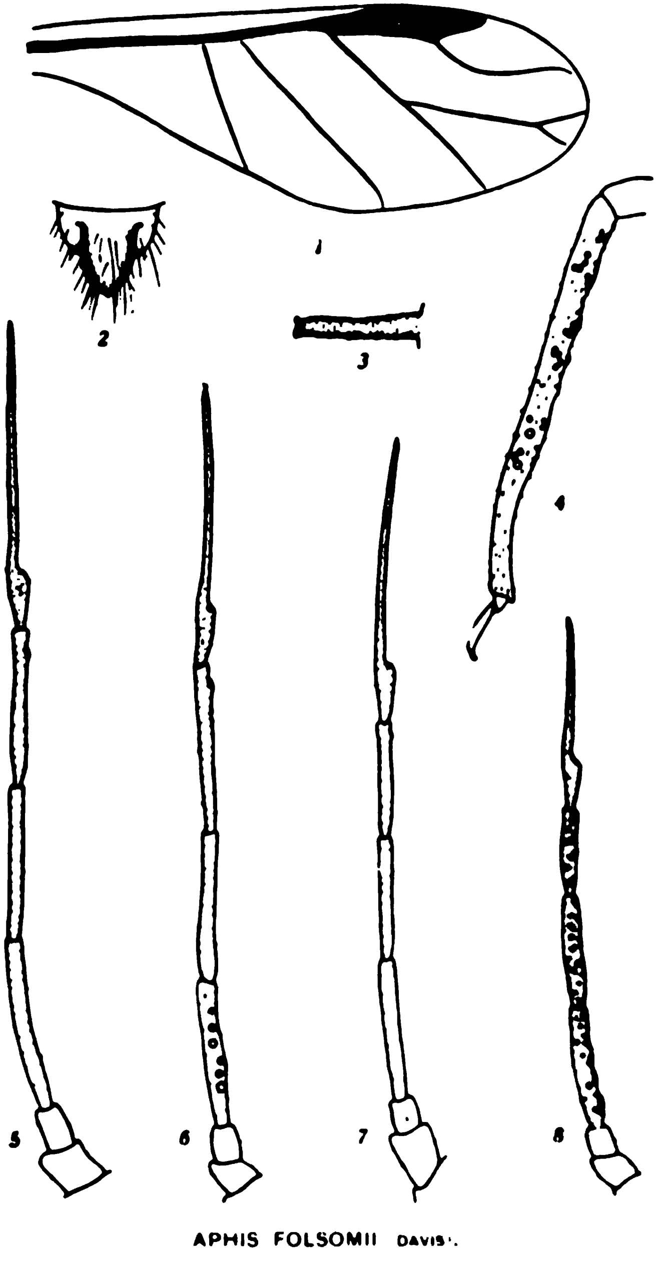
BY NATHAN BANKS

Complete to Summer of 1907   Price 50 cts. (net) per copy   Mailed on receipt of price

☞ Send for copy of New Additions to ☜
Price List; just issued.

E. T. CRESSON, Treas., P. O. Box 248, Philadelphia, Pa.

When Writing Please Mention "Entomological News."



APHIS FOLSOMII DAVIS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. APRIL, 1908. No. 4.

CONTENTS:

Davis—A New Aphid on the Virginia Creeper.... 143
Snyder—Color and Environment.... 147
Skinner—A New Variety of Papilio philenor.... 149
Jones—Pitcher-Plant Insects III.... 150
Hebard—A New Genus and Species of Decticinae (Orthoptera) from California.... 156
Fall—New Scarabaeidae.... 159
Engel—Notes on Sesiidae.... 164
Brimley and Sherman—Additional Records of Tabanidae (Horse-Flies) of North Carolina.... 168
Doane—New North American Pachyrhina, with a Table for Determining the Species.... 173
Rohwer and Cockerell—Some Oxybeline Wasps from New Mexico.... 179
Editorial.... 181
Entomological Literature.... 182
Notes and News.... 183
Doings of Societies.... 184

A New Aphid on the Virginia Creeper.

(APHIS FOLSOMII n. sp.)

By JOHN J. DAVIS, Urbana, Ill.

(Plate VII.)

Last spring (1907) I noticed numbers of this plant louse on the vines of the Virginia creeper, *Parthenocissa (Ampelopsis) quinquefolia,* which were growing in an old greenhouse. The old frames of the greenhouse were much warped, leaving large openings through which the vines gained access to the room. Here the lice made their appearance and were most abundant, though later in the summer they were not uncommon on the same vines outside of the building. I have examined the Virginia creeper at other places, both in Urbana and in other Illinois localities, but nowhere else have I been able to find this species.

My first observations were made May 2, 1907, at which time only a few individuals were to be found and they occurred singly upon the young shoots. These aphids were nearly adult and were probably the stem mothers. During the earlier part of the year it required twelve to fourteen days for them to become mature, but later in the warmer summer months the period for maturity was much shorter. The number of young per female was, in two instances, 106 and 109, respectively. The length of time required to give birth to these young were 15 and 21 days respectively, or an average of 7 plus in the first case and 5 plus young per day in the second.

The lice were evidently partial to the young tender shoots, but later in the summer when these became crowded, some of the aphids were obliged to secure their food supply from the leaf petioles or the undersides of the leaves.

The first adult winged form was noticed May 21st, it having been born May 9th or 10th. The lice continued to increase in numbers until about the middle of July, but from then until about August 12th, only occasional specimens were found, the others having become winged and having probably migrated to other places. They began to be more numerous, however, August 12th, and by August 19th were comparatively abundant, most of them being immature individuals. This second appearance of the aphids in numbers was not due to return migrants, but rather to the progeny produced by the few wingless forms that had remained. I was unable to follow up the appearance of the bisexual generation, but when examinations of the vines were made the first part of October, wingless oviparous females and winged males were found *in copula*, and also a few eggs deposited upon various parts of the vine. Later in the fall but occasional eggs could be found upon the vines and I concluded that the ant (*Cremastogaster lineolata*) had carried them to its nest. From the very first appearance of the aphids and throughout the summer this ant had been in constant attendance upon them. The lice secreted, from the anus, a somewhat milky fluid which soon became more or less solidified. Upon the parts of the plant occupied by the lice many of these globules were usually found.

Aphis folsomii n. sp.

Wingless viviparous female.—Body very dark brown, head paler. Antennæ dark brown to black, excepting the fourth and fifth segments, which are white; not reaching the cornicles. Eyes black. Beak pale, excepting the bases of the femora and the distal ends of the tibiæ. Fore legs light brown, excepting at the joints and the tarsi. Middle pair of legs as in fore pair, except that the darkened area is greater. There are about five indistinct spots or pits, darker than the body color, dorsally and on each side of the abdomen. Cornicles black, cylindrical, imbricate, slightly dilated apically, and two and a half to three times the length of the tarsi. Style black, conical and about one-half the cornicles in length.

Measurements.—Length of body, 2.0-2.254 mm.; width, 1.40-1.781 mm.; antenna, I, 0.081; II, 0.049; III, 0.212; IV, 0.146; V, 0.195; VI, basal, 0.114; filament, 0.228; total, 1.025 mm. (Measurements from live specimens.)

Winged viviparous female.—Head and thorax black, abdomen dark brown. Antennæ concolorous with the abdomen, not reaching to the cornicles, imbricated; with four to seven circular sensoria on segment III and, as usual, one at the distal end of V, and several at the apex of the thickened basal portion of VI. Eyes black. Wings hyaline, with conspicuous black veins, the first and second discoidals branching at a point about two-thirds the distance from where they leave the third discoidal to the margin. Legs dark with small paler areas at the middle of the tibiæ and femora. Cornicles black, cylindrical, imbricated, slightly dilated apically, and twice the length of tarsi. Style dark, conical, and one-half as long as the cornicles.

Measurements.—Length of body, 1.62-2.036 mm.; width, 0.81-0.98 mm.; length of wing, 2.21-2.62 mm.; antenna, I, 0.0652; II, 0.0733; III, 0.2727; IV, 0.2454; V, 0.2545; VI, basal, 0.1031; filament, 0.3999; total, 1.4141 mm.; cornicles, 0.218-0.255 mm.; style, 0.122 mm.; hind tarsus, 0.126 mm. (Measurements from live specimens.)

Pupa.—Abdomen with no white flocculent spots. Legs (excepting tarsi), antennae (excepting tips), and cornicles white, to the naked eye. Style with a slight whitish bloom.

Wingless oviparous female.—Abdomen reddish brown, thorax darker, and head paler. Antennae dark, excepting segments III, IV, and V, which are white, imbricate, and not reaching to the cornicles. Eyes black. Beak reaching to hind coxæ. Abdomen with a row of very minute black dots on each side. Tarsi and articulations of the fore pair of legs dark to black, remainder pale brownish; middle pair with darkened area larger; hind legs almost entirely dark brown to black, the hind tibiæ swollen and with numbers of sensoria along the inner side. Cornicles concolorous with abdomen, cylindrical, imbricate, and slightly longer than the body color, conical, equal to or slightly less than the hind tarsi in length.

Measurements.—Length of body, 1.5273-2.1816 mm.; width, 1.0908-1.2816 mm.; antenna, I, 0.0801; II, 0.0611; III, 0.2635; IV, 0.2159; V, 0.1969; VI, basal, 0.0896; filament, 0.3273; total 1.2444 mm.; cornicles, 0.1738 mm.; hind tarsus, 0.1344 mm.; style, 0.1141 mm. (The above measurements are averages from specimens mounted in balsam.)

Egg.—The black shining egg is elliptical and measures 0.7009 by 0.3260 mm.

Winged male.—Head and thorax black, abdomen dark reddish brown Antennæ black, imbricated, with numerous circular sensoria irregularly placed on segments III, IV, and V. There are usually twenty or thirty sensoria on III and IV, and half that number on V, but these numbers sometimes vary although the proportions are generally the same. Eyes black. Wings hyaline, with black veins, the first and second discoidals branching at a point about two-thirds the distance from where they leave the third discoidal to the margin. Legs dark to black, excepting the middle portions of the tibiæ and femora. Cornicles very dark, almost black, cylindrical, imbricated, slightly less than the hind tarsi in length. Style dark but not black, conical, and longer than the tarsus.

Measurements.—Length of body, 1.1909 mm.; width, 0.5636 mm; length of wing, 1.7452 mm.; antenna, I, 0.0591; II, 0.0529; III, 0.2180; IV, 0.1805; V, 0.1650; VI, basal, 0.0825; filament, 0.2872; total, 1.0542 mm; cornicles, 0.0978 mm; hind tarsus, 0.1141 mm. (Measurements from specimens in alcohol and in balsam.)

Mr. T. A. Williams, in a bulletin of the Department of Entomology, University of Nebraska, listed a new species, *Aphis parthenocissi* on *Parthenocissa quinquefolia*, but did not describe the same.

This species is closely allied to *Aphis ilicis* Kalt.—(*A. hederae* Kalt.) of Europe, but compared with the European descriptions is quite distinct.

I respectfully dedicate this species to Doctor Justus W. Folsom, who by the publication of "Entomology with reference to its Biological and Economic Aspects" has done so much for the advancement of entomology, and to whom the writer is indebted for many helpful suggestions.

EXPLANATION OF PLATE VII

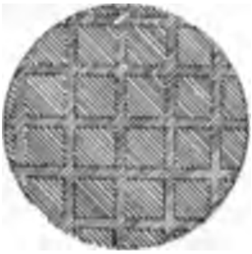
Aphis folsomi. 1, wing of viviparous female; 2, style of winged viviparous female; 3, cornicle of winged viviparous female; 4, hind tibia of oviparous female, showing sensoria; 5, antenna, of wingless viviparous female; 6, of winged viviparous female; 7, of wingless oviparous female; 8, of winged male.

Color and Environment.

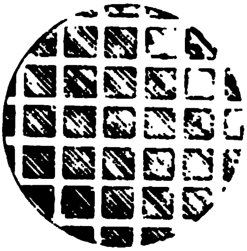
By Howard Austen Snyder, Philadelphia, Pa.

While collecting insects in the Bermuda Islands in the year 1905, I perceived that the common wasps I saw flying were of a lighter shade than those of the United States, and expected to find in my net a species different from our own, but on examination I saw that they were identical with our *Polistes pallipes*. The difference in shade I attribute to the fact that as Bermuda has coral roads and white calcimined roofs, the average shade of the country has had the effect of producing a lighter shade in its insects. As every one knows, the more contrasted in color or shade an insect or bird is with relation to surrounding objects, or the background on which it rests, the more liable it is to be discovered and devoured or killed by its enemies. Locally we see that effect in the locust, *Trimerotropis maritima,* and the tiger beetle, *Cicindela dorsalis,* of our own coasts, which from their habit of frequenting the light sandy tracts, have had their darker ancestors eliminated by this fact in the economy of nature, and only the light ones remain and are inconspicuous and less liable to destruction. Their color serves to keep them on the sand, for let them wander inland where there is vegetation and a darker soil, and they are soon discovered and destroyed. With bees and swift flying creatures this rule cannot so well apply, as they are never long in one place, and can elude their enemies. The tiger beetle and locust alight frequently and are more often resting in sight of enemies.

I mean to indicate by the above that in any country, especially an isolated one, the insects will average darker or lighter according to the shade of the land and vegetation. Let a dark insect inhabit a country where the roads and the roofs are white, it will be rendered conspicuous and thus exposed to danger oftener than it would be in a country where the surface is darker. The diagram below will portray in a general way the appearance of Bermuda as compared with that of the United States—not exactly, of course. For the proper effect, the diagram should be viewed at a distance of ten feet, when the difference in degree will be seen without detail.



United States.



Bermuda.

The average road in the United States is about the color of a plowed field, and hence of little effect in modifying the general shade. In Bermuda the roads are closer than in Pennsylvania, and hence effective in lightening the general aspect of the country- and added to this, the roofs increase the effect, and although an insect in its flight might many times fly over or alight on a dark background, among the thousands of objects visible, of two insects of one species, the slightly darker one will be the first discovered on a light background, the lighter ones will live the longer and naturally have more descendants.

It seems unnecessary since acquaintance with Darwin's theory is so wide-spread, to say that although all animals resemble their parents, they all vary in minor particulars, and any difference in color or otherwise may serve to protect one and enable it to live long enough to produce its kind with a like resemblance and a little immunity. Nature seizes upon that which is good.

It may be asked why these insects are not still lighter, but here the law of equilibrium intervenes and prevents a further advance There is danger when it becomes too light of becoming too conspicuous. Taking an extreme case, a white insect would be at once a prey of its enemies when on or over the darker vegetation. They are held back far enough from white to be fairly safe on a dark background.

This theory cannot be tested in a large country, where the shades and colors are various, and can only partially be proven in an isolated country. The Bermudian surface affords us the best possible exemplification of the theory.

As material for reasoning in this line, let us imagine a coral island placed seven hundred miles from the mainland, as Bermuda is, but connected with it by a chain of islands, as Bermuda could have been, and let all the intervening islands become submerged by the subsidence of the sea bottom, which is possible. Up to this time, the insects of the mainland have had free access to all the islands, and vice versa. Consequently, the species are similar and the above condition among the insects of the island cannot arise, but now that they are cut off from the mainland, the local environment begins to shape their destiny, which seems to be as described.

I believe that all insects so placed will have their colors modified unless extremely well defended by poisonous qualities, weapons of defense or underground habits.

A New Variety of Papilio Philenor.

By Henry Skinner.

Papilio philenor hirsuta n. var.

This differs from the ordinary form in the hairy character of the body and the shortness of the tails. The thorax and abdomen are clothed with long black hairs and the tails are 4.5 mm long. Male and female from Plumas County, California, 9,500 feet elevation. Received from Mr. George Franck.

Editors, Ent. News:—I take pleasure in announcing the recent organization of "The Association of County Entomologists" of California, formed in San José, February 15th, 1908. W. H. Volck, Entomologist for Santa Cruz and Monterey Counties, was made president, and E. L. Morris, Entomologist for Santa Clara County, secretary and treasurer. The object of the Association is for a more perfect co-operation in dealing with problems common to the orchardists of the districts represented. We hope by frequent consultations, comparison of plans and results of work to be better able to further the horticultural interests in our counties.—Earl L. Morris, *Secretary*.

Pitcher-Plant Insects.—III.

By Frank Morton Jones, Wilmington, Delaware.

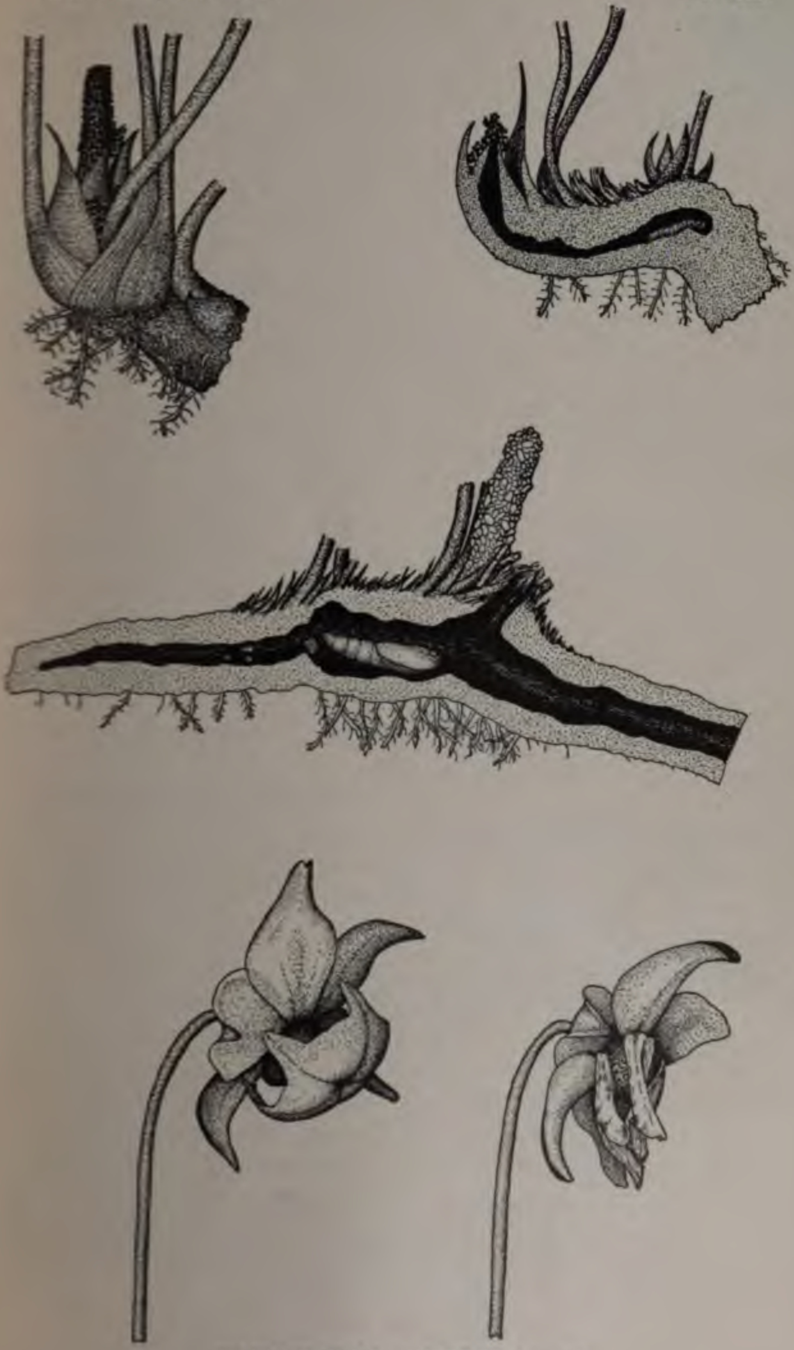
(Plates VII-IX.)

Papaipema appassionata Harvey.

Of the insects observed at Summerville, South Carolina, making *Sarracenia* their food-plant, next in abundance to the Exyras was a root-borer which proved to be *Papaipema appasionata* Harvey. The burning over of the meadows makes the work of this insect in the roots of *Sarracenia flava* much more apparent than in those places where the tangled clumps of leaves of the preceding season conceal the ground. On these comparatively bare portions of the Sarracenia meadows, and especially in the less swampy places, it becomes apparent early in April that a very large proportion of the roots of *Sarracenia flava* contain this larva, which bores, first perpendicularly through the buds, then horizontally, following the course of the root-stock and keeping open the passage to the surface for the disposal of the frass, which is built up into a closed turret-like tube, capping the entrance to the burrow

So numerous are these burrows that whole clumps of *flava* with their interlaced root-stocks fail for a time to put up either buds or leaves, and many which start to grow are undermined and killed by the operations of the borer. The much larger frass-tubes formed in the preceding year by full grown larvæ are also noticeable among the roots, showing that these structures are compact and tough enough to last through a winter's exposure to the weather. Their purpose is probably to prevent the burrows from being flooded during rains and temporary inundations. At first only a fraction of an inch in height, these turrets are extended with the growth of the larvæ to a height of two inches or more, and are often built against and partly supported by one of the larger fleshy leaf-stems, through which the burrow extends into the root-stock

The upper figures on Plate VIII, show the condition of the turrets, the extent of feeding, and the position of the larvæ in the root-stocks on April first. Throughout the sum-



PITCHER-PLANT INSECTS (JONES).

mer these larvæ extend their burrows through the root-stocks, throwing up new turrets from time to time as they follow the winding course of the interlaced roots. Pupation takes place in a wide part of the burrow, not far from the surface, provision having previously been made for the escape of the moth (middle figure, Plate VIII). The first pupa was noted September twenty-second, though some not observed were evidently a few days earlier; the moths commenced to emerge October sixteenth, the last emergence of eighteen being November third.

The unusually long larval period is presumably the effect of the long season in this southern locality, the insect being single-brooded here as in the north.

Mr. Henry Bird has described this larva from specimens found in *Sarracenia purpurea* in New Jersey (see Can. Ent. xxxv, 91-94), in which plant they did not pupate in the burrows, nor was the turret-building habit observed. Mr. Bird has kindly compared the South Carolina specimens from *flava* with his New Jersey specimens from *purpurea,* and finds them identical, the examples bred from *flava,* as would be expected, being slightly larger.

Olethreutes daeckeana Kearfott.

The larva of *Exyra rolandiana* has been noted as feeding in the flowers and unripe ovaries of *Sarracenia purpurea.* At Summerville no *Exyra* larvæ were found in the flowers of either *Sarracenia flava* or *Sarracenia minor.* The flowers of *minor,* however, which begin to appear toward the end of April, are frequently destroyed by a small Tortrix caterpillar, which feeds among the petals and stamens and also burrows into and hollows out the green ovary, fastening the debris of the flower together with silk. In these larva-infested flowers the umbrella-shaped style withers and the shrivelled petals cling to the wreck of the flower instead of falling at the usual time. The lower figures on Plate VIII illustrate a healthy flower after the fall of the petals and an infested one.

These larvæ were noted about May first, when a few of them were almost full fed; they became more abundant by the middle of the month. A slight cocoon is formed in the flower from the debris loosely held together with silk, and from this the brown pupa pushes its way out some hours before the emergence of the moth. Of those under observation, the first appeared May twenty-third, though at that date many of the later larvæ had not pupated. The latest emergence noted was June thirteenth.

From unripe ovaries of *Sarracenia purpurea* gathered near Katahdin Iron Works, Maine, later in the season (August), the same insect was bred, and Mr. Kearfott identifies it as *Olethreutes daeckeana*, a species which he described in 1907 from a New Jersey locality where its food-plant was also *Sarracenia purpurea*, so it is evidently widely distributed and will probably be found wherever *Sarracenia* is abundant.

Archips parallela Rob.

Toward the end of May still another insect may be found attacking *Sarracenia minor*; this is the larva of a Tortricid,—a smooth, cylindrical caterpillar about seven-eighths of an inch in length, dull dark sage-green in color, studded with small white tubercles bearing short fine white hairs; the head and thoracic shield are yellowish-brown with black markings, and the feet black.

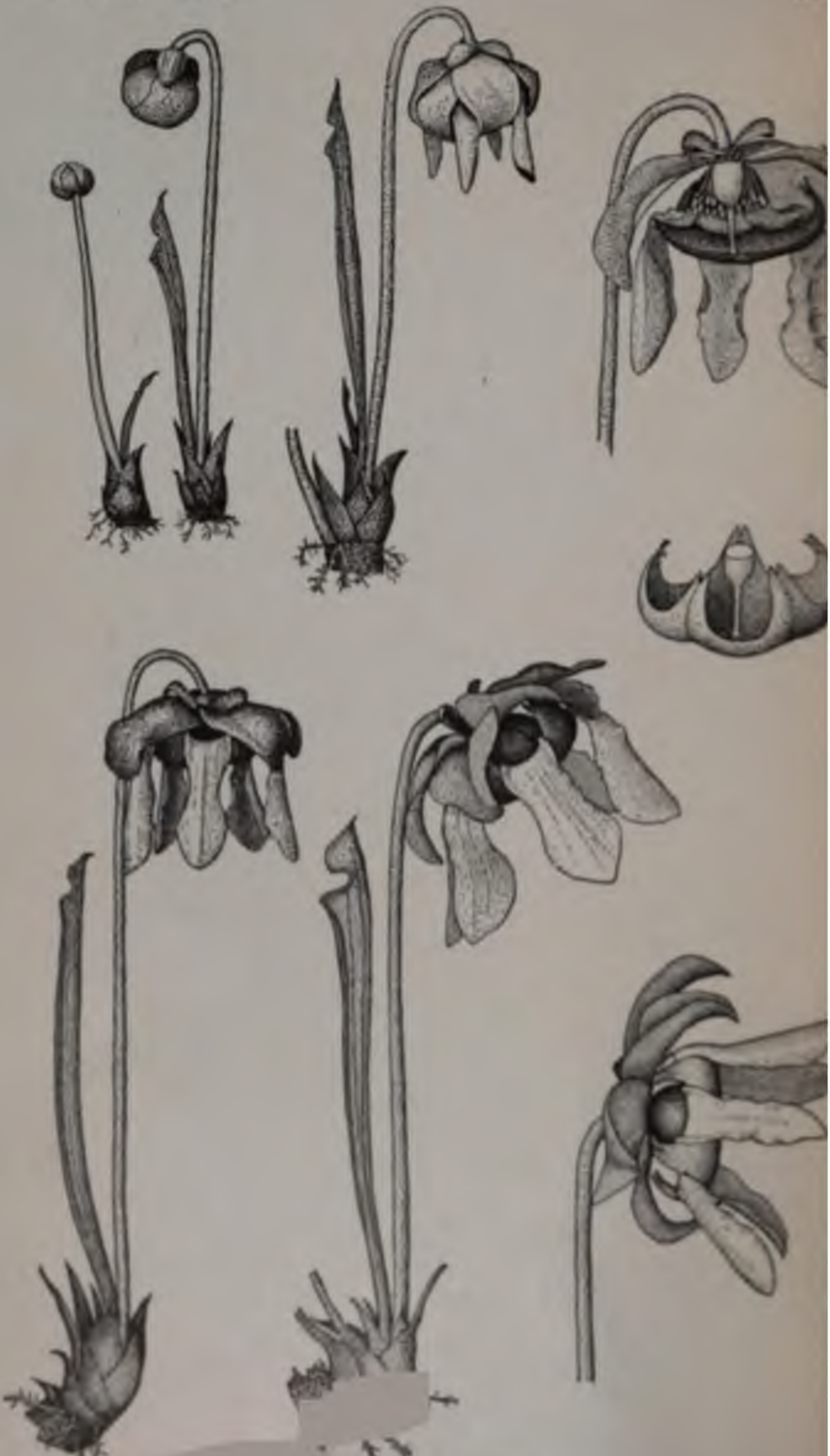
This caterpillar seems to prefer the smaller open leaves of *Sarracenia minor*. It fills the upper portion of the tube with a white opaque web, through which it retreats in a tortuous passage when alarmed. In feeding it takes no care not to eat entirely through the leaf wall, and the upper portion of the hood usually shows a ragged hole where the caterpillar has fed. A number of these larvæ of different ages were found in localities widely separated, so their occurrence in this food plant was evidently not accidental. Of these, one fell a victim to the new leaf to which it was transferred evidence that this insect has not yet perfectly adapted itself to this dangerous food plant. One larva on June third left the leaf in which it had been feeding, ensconced itself on the outside of another leaf of *minor* in the angle formed by the flat wing of the leaf and the outside of the tube, and here spun a tubular shelter by bridging this corner with a web of opaque white silk; here, a few days later, it changed to a brown pupa, which on June twenty-second forced its way out of the cocoon by means of the double row of spines with which its segments are armed, and the moth emerged. Mr. W. D. Kearfott pronounces the moth to be a typical specimen of *Archips parallela* Rob., a widely distributed species with a long list of recorded food-plants. On some of its other food-plants this caterpillar spins several leaves together to form a more or less tubular shelter. It would be interesting to determine to what extent it is adapting itself to the other species of *Sarracenia* found within its range.

POLLINATION.

That *Sarracenia* must depend upon insect agency to effect pollination of the blossom was recognized long ago by the botanists, and the structure of the flower indicates something of the method by which this must be accomplished. Careful observation of the insect visitors of *Sarracenia flava* throughout its blooming season make it seem probable that in this species the method of pollination differs in some respects from the published accounts of this process in the genus *Sarracenia* in general. In *flava,* as in the other species of the genus, the style is a curious umbrella-shaped structure, each of its five points being cleft, and the stigmatic surfaces are situated on little projecting points at the base of these clefts on the concave side of the open umbrella. The petals at the base form a close bell-shaped cover, spreading out and filling the space between the points of the inverted umbrella; and access to the nectar and pollen is possible only at one of five openings, situated just below the curled-up tips of the umbrella with their projecting stigmatic points.

An insect alighting on a petal enters the flower, turns at right angles in either direction to one of these openings, and in forcing its way through, if of suitable size, scrapes its back across the projecting point of the stigma. In *flava* especially, egress is exceedingly difficult except at the five entrance holes; and all of the numerous insects observed visiting these flowers emerged after considerable struggling through one of these orifices, almost invariably again scraping the stigma in their departure. In *flava* therefore, with its heavy closely-overlapped petals usually preventing the escape of the visiting insects except by repassing the stigma, some special provision for preventing habitual self-pollination by insect agency would be expected; and this seems to be provided for in the position the flower assumes upon its stem at various ages. When the bud first appears above the ground it is borne upright upon the stem; as the blooming period draws near, the stem bends just below the bud, making a complete turn, so that when the flower opens the style occupies the position of an inverted umbrella, catching and retaining the falling pollen, most of which is shed within twenty-four hours after the flower begins to open. The flower then begins again to change its position, often being very noticeably tilted on the stem by the third day, and eventually, long before the fall of the petals, it takes a position at right angles to the original one. These changes of position and the structure of the flower are shown on Plate IX. The tilted and finally upright flowers naturally retain less pollen than the newly opened horizontal ones, and often the tilted flowers show little trace remaining of the abundant supply in the newly opened blooms. As the blossoms remain fresh and continue to be attractive to insects for more than two weeks, it would seem that this change in the position of the flower and the consequent spilling of the pollen decidedly favor cross fertilization.

Ants are almost invariably present in the flowers, attracted by the abundant nectar oozing from the ovary, but they are probably of little importance as pollenizers. The ant most abundant in *flava* at Summerville is identified by Prof. W. M. Wheeler as *Tapinoma pruinosa* Roger. Ants, wasps, and occasionally butterflies visit the outside of the flower; spiders,



PLANT INSECTS (JONES).

small beetles, and even the little green tree frogs which habitually occupy the leaves, are sometimes found ensconced in the flowers; but from the first opening of the *flava* blossoms in March, their most frequent visitor on sunny days is the honey-bee, which being of suitable size to snugly fit the orifice, rarely enters or leaves without brushing the stigma. Most of these bees carry loads of pollen, and do not seem to exercise any choice, relative to the age of the flowers, in making their visits. Much smaller bees, *Augochlora* and *Osmia,* are less frequent visitors and on account of their size usually escape contact with the stigma. At rare intervals a bumble-bee may be seen forcing its way into the flower by the usual path, but this insect proved so infrequent a visitor that it can scarcely be considered of much importance as a pollenizer of *flava.*

One other insect, however, of suitable size to effect pollination, an insect always associated with *Sarracenia,* is a constant visitor to the blossoms. The Sarracenia fly, *Sarcophaga sarraceniae* Riley, habitually resorts to the blossoms as well as to the leaves, perhaps more for shelter than for food. At night and on cool, windy or rainy days these flies crowd into the blossoms, sometimes to the number of three or four to one flower; they are rough, bristly, and often yellow with pollen: they enter and leave the flowers by the only practicable path, the orifice just under the stigma, which they are of suitable size almost necessarily to touch in passing.

It has been suggested that the pitcher plant moths (*Exyra*) may be pollenizers of these flowers; but as *flava* at Summerville commences to bloom in March, and *Exyra ridingsii,* the species most intimately associated with it, does not appear until the middle of May, and *Exyra semicrocea* not until the middle of April, this can scarcely be the case. The color of the flowers and the fact that their fragrance becomes more noticeable toward evening indicates the possibility that night-flying insects may aid in pollination. The following list includes all the day-time visitors found in sufficient numbers to indicate that they are habitual visitors to these flowers:

In *Sarracenia flava*:
  Coleoptera:
    Chauliognathus marginatus Fabr.
  Diptera:
    Sarcophaga sarraceniae Riley.
  Hymenoptera:
    Apis mellifera L.
    Bombus Pennsylvanicus De G.
    Augochlora (*confusa* Robt.?).
    Osmia sp.
    Halictus sp.
    Tapinoma pruinosa Roger.

The small brilliantly-metallic bees, *Augochlora*, and an *Osmia*, were also noted frequenting the blossoms of *Sarracenia minor*, which did not seem to be visited by the larger insects. Dr. Mellichamp has recorded a beetle, *Euphoria melancholica* as an occasional visitor to this flower. The size and structure of the flower, however, seem to indicate the small bees as the more suitable pollenizers.

* * *

A New Genus and Species of Decticinae (Orthoptera) from California.

BY MORGAN HEBARD.

Cyrtophyllicus* new genus.

This genus is related to *Zacycloptera* Caudell† from which it differs chiefly in the very minute wings, the different form of the cerci and tegmina and the more spinose legs.

Male only known. Fastigium blunt and not half as broad as basal joint of antennae. Pronotum slightly produced caudad, dorsal surface almost flat; lateral carinae not distinct cephalad but developed as distinct shoulders caudad, diverging regularly caudad and at the caudal margin separated by a little more than twice the width at the median portion of the pronotum. Pro-femora armed with a pair of long slender

---

*[illegible] ciaos, that which resembles.

†Proceedings U. S. Nat. Mus., Vol. XXXII, p. 308.

spines. Mesosternum armed with a similar pair of spines. Tegmina short, not reaching the apex of the abdomen, rounded and inflated. Wings very minute. Supra-anal plate small and obscure, the last dorsal abdominal segment produced, deeply and rounded emarginate, bounded laterad by rounded

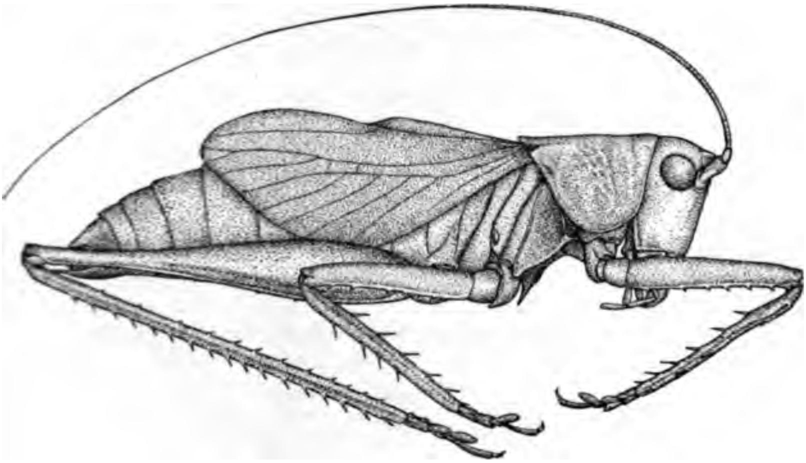


FIG. 1.

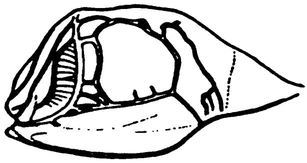


FIG. 2.

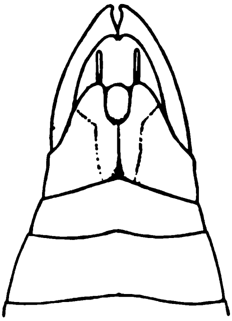


FIG. 3.

Figure 1. *Cyrtophyllicus chlorum* n. gen. and sp. Lateral view of type. (x 3.)

Figure 2. *Cyrtophyllicus chlorum* n. gen. and sp. Tympanum of male. (x 3.)

Figure 3. *Cyrtophyllicus chlorum* n. gen. and sp. Dorsal view of apex of male abdomen. (x 6.)

lobes. Cercus slender, somewhat bowed and armed with a single heavy tooth. Legs moderately long, slender and well spined.

Type.—*Cyrtophyllicus chlorum*, new species.

Cyrtophyllicus chlorum new species.

Type.—Male; El Portal, Mariposa County, California. Altitude, 3,200 feet. August 30, 1907. Collected by Morgan Hebard. (Hebard collection.)

Size moderate; form somewhat slender. Head not broader than cephalic portion of pronotum into which it is well inserted; fastigium of vertex short, blunt, compressed and deeply sulcate; eyes small, prominent and semiglobose; antennæ in length almost six times that of pronotum, filiform, width of basal segment two thirds that of eye, antennal scrobes somewhat protuberant. Prozona of pronotum not punctate, metazona rugoso punctate, separated from the prozona by a distinct straight transverse sulcus; median carina of pronotum scarcely visible; prozona twice the length of metazona; cephalic margin perceptibly concave, caudal margin broadly rounded. Tegmina slightly more than twice as long as the pronotum, broad and considerably swollen, apically rounded, the costal field much enlarged, costal margin arcuate; tympanal area distinctly wider than the caudal width of the pronotal disk, its length exceeding width by a third of the latter. Wings minute falciform lobes. Abdomen moderately plump, rounded without dorsal carina, the terminal dorsal abdominal segment covered with very fine hairs. Cerci more than five times as long as the basal width, covered with very fine hairs and on the inner side near the tip armed with a heavy, short and sharp pointed tooth. Subgenital plate with a very shallow subtrigonal apical emargination, styles long and filiform. Legs moderately long and slender, covered with short fine hairs, posterior femora two and one half times as long as pronotum and very little swollen on the basal half, armed below on both margins on the apical half only with eleven to twelve small sharp spines, anterior and median femora of equal length, longer than the pronotum by a quarter of its length, both armed below on both margins with small spines numbering six to eight on the margins of the anterior femora and seven to eleven on those of the median femora. Posterior tibiæ slightly compressed, armed below with two apical spurs, margins well spined, anterior and median tibiæ armed below with six pairs of heavy spines, anterior tibiæ with four spines in the dorso-caudal margin.

General color uniform bright grass green, eyes pale nut brown, antennæ straw color.

MEASUREMENTS.

Length of body	26.2 mm.
Length of pronotum	6.1 mm.
Greatest caudal width of pronotal disk	5. mm.
Length of tegmen	14.5 mm.
Width of tympanum	6.5 mm.
Length of caudal femur	17.2 mm.

The single specimen taken was collected at night with the aid of a lantern, stridulating loudly on a low green bush. Even when approached it did not cease its stridulation, but kept up a loud and constant zick, zick, zick, zick,........much like our eastern *Scudderia* but far louder. Other individuals were heard stridulating loudly during the night until just before dawn.

In endeavoring to capture other specimens during the evening one was located in a high oak tree, another about twelve feet from the ground in a dense bush, another in a tangle of vines near the ground and others, including the specimen captured, in low green bushes on the mountain side. All collecting was done after dark which made it very difficult to locate the specimens, and, although they did not move until approached very closely, they usually ceased their song when disturbed. One which I succeeded in almost grasping escaped by tumbling down into the thick weeds under its perch.

New Scarabaeidae.

By H. C. Fall.

The present article was primarily designed to make known an interesting new species of *Thyce* discovered by Mr. G. H. Field, of San Diego, in the summer of 1906. The opportunity is taken, however, to add descriptions of two species of *Lachnosterna* and a *Polyphylla* which appear to be without names. The relation of each of these to previously described forms is easily made known, and there is therefore little use in awaiting monographic treatment of their genera of which there is either little need or small prospect in the near future.

Thyce fieldi n. sp.

Of the usual form, head and thorax piceous, elytra blackish brown, legs paler brown, vestiture pale ochreous. Head densely clothed with elongate scales and fine erect hair, prothorax and elytra with rather sparse recumbent acuminate scales, which are as a rule from two and one-half to three times as long as wide; sterna densely clothed with long cinerous or ochreo-cinerous hair, venter densely cinero-squamulose. Clypeus sinuato-truncate (♂) or arcuato-truncate (♀). Prothorax four-fifths as long as wide, sides parallel in basal three-fifths, surface polished and finely rather sparsely punctate, especially toward the middle posteriorly; median line impressed and punctured. Elytra nearly parallel, finely feebly somewhat densely punctate, without costae; suture densely clothed with white scales. Length 22-23½ mm.

Male.—Antennal club subequal in length to entire stem, last joint of maxillary palpi fully three-fourths as long as the antennal club, with a broad, deep, oval excavation throughout its length. Front tibiae entirely devoid of teeth except the apical one. Outer claw of each tarsus with an acute tooth which is about one-third as long as the apical portion of the claw; tooth of inner claw of front tarsus about one-half as long as that of the outer claw; the disparity evident, but less marked on middle and hind feet.

Female—Brown throughout, a little wider behind, vestiture sparser, clypeus smaller, the angles rounded; head with the vertex obtusely tumid. Antennal club about three-fourths the length of the preceding joints; last joint of maxillary palpus half as long as the antennal club; front tibiæ strongly bidentate; tarsi a little shorter; teeth of claws smaller than in the male, but showing nearly same disparity.

Five examples (4 males, 1 female) of this fine species are before me, all collected by Mr. Field, in the southern part of San Diego County, California.

The simple front tibiæ of the male, bidentate in the female, and the polished sparsely punctured thorax distinguish this species at once and remarkably from all previously described forms. It is dedicated with pleasure to its discoverer from whom I received one male taken in the summer of 1906, at Campo, elevation 2,400 feet. It was at once recognized as a new species and I wrote Mr. Field urging him to go for them again the following summer, when it was hoped females might be secured. A visit to the same region last July was successful, and Mr. Field has kindly sent me three more males and one female from his catch. Only two or three of the latter sex were obtained. A short extract from a letter from Mr. Field relative to this trip will be of interest in this connection. He writes:—

"We started (from San Diego) June 29, and a hot spell started the same day we did. The first week was withering, blistering hot and, as we drifted along the Mexican border in the semi desert country, Hell could not have been more than a half mile off, and it wouldn't have surprised me at all to see old Mr. Devil sitting under a sage brush or greasewood. I cut out the Devil's canyon trip on account of the intense heat, and as it was impossible to take the horses any nearer than Mountain Springs, we actually could not have carried water enough to quench our thirst until we got back. I was obliged to make a long hot drive to reach the Thyce tree, but made it, and while supper was cooking I placed the cyanide bottles and nets by the tree to be prepared for an emergency call, but the infernal rascals did not come out till it was all but dark, and then they did come with a rush as they did before. There were not nearly so many out, but after the battle we counted thirteen slain."

Mr. Field narrates further adventures with the new *Thyce*—but this is sufficient to indicate some of the conditions incident to their capture.

Polyphylla fuscula n. sp.

Most nearly allied to *diffracta* Csy., but smaller and conspicuously darker owing to the sparse vestiture and subobsolete elytral vittæ. Head and entire disk of thorax clothed with erect hairs, these becoming sparser and shorter toward the sides of the latter; thoracic vittæ narrow and imperfect, the scaly vestiture pale yellowish in color throughout, not at all paler in the feebly condensed lines which represent the more or less strongly marked white vittæ of the related species. Antennal club about three-fourths longer than the stem. Pygidium squamulo-pubescent, the hairs and squamules not very densely placed, and both nearly evenly distributed over the entire surface, the lateral and apical margins only slightly reflexed. Front tibiæ bidentate (♂). Length 19-20 mm.

Chiricahua Mountains, Arizona.

Described from three males collected by Mr. V. W. Owen, of Los Angeles, who has very kindly placed them at my disposal. In one example the elytral vittae are almost entirely wanting, in the others a little better defined. The antennal club is relatively shorter than in any of our previously described species. The shorter spur of the anterior tibia is about three-fourths the length of the longer one, and this seems also about the ratio prevailing in both *diffracta* and *crinita* notwithstanding Casey's statements of existing differences.

Lachnosterna lenta n. sp.

Oblong, scarcely wider behind, robust, not strongly convex, castaneous, legs paler. Clypeus feebly emarginate, border rather widely reflexed, surface moderately finely punctate, the punctures well separated; front similarly punctured, more sparsely at middle, in some examples. Thorax obliquely narrowed in front, sides subparallel posteriorly, margin finely crenate, punctuation coarse, close, and nearly evenly distributed. Elytral punctuation as coarse as or slightly coarser than that of the thorax, and equally dense; sutural costa distinct, discal costa faint but evident, marginal obsolete. Pygidium finely sparsely punctate, nearly smooth in the female. Metasternum hairy in both sexes, the hairs shorter and less dense in the female. Abdomen minutely remotely punctate Last joint of maxillary palpus elongate fusiform, not impressed. Length 17-20 mm, width 10-12 mm

Male.--Antennal club slightly longer than the entire stem; pygidium broader and evenly convex; abdomen flattened at middle, the penultimate segment with an arcuate or subangulate slightly roughened ridge a little behind the middle; last ventral broadly concave, smooth at apex; inner spur of hind tibia short, one third to two fifths the length of the outer one; ungual tooth smaller, acute, distinctly intra median in position.

Female Antennal club shorter than the stem; pygidium smoother, more narrowly rounded and slightly tumid at apex; inner spur of hind tibia nearly as long as the outer; ungual tooth larger, median

This species is a member of the *ephelida* group and should stand between *generosa* and *praetermissa*. It is closely related to the latter, differing in its rather more robust form, coarser, denser punctuation, somewhat more widely reflexed clypeus, the thoracic margin more evidently crenulate The genitalia are quite distinct from the figures given by Smith, for *praetermissa*, the male claspers more complex as viewed laterally. The pubic process in the female is long, slender, and forked at tip. In *praetermissa* the public process of the female is shorter and stouter, much as in Smith's figure for *villifrons*, the tips of the arms with two or three short setæ.

Described from 3 males, 1 female, taken at Mobile, Ala., by Mr. T. P. Loding, and sent me by Mr. Knaus.

Lachnosterna lobata n. sp.

Elongate cylindrical, not or scarcely broader behind, brown, elytra sparsely clothed with short erect hairs, few if any of which exceed in length one-fourth the width of the scutellum, and which are arranged for the most part along the costæ. Clypeus with a moderate cuspiform emargination, the border moderately reflexed, the surface together with that of the front densely but not coarsely punctate, the latter smoother along the clypeal suture. Prothorax nearly twice as wide as long, widest and rather strongly rounded at middle, sides a little sinuate both anteriorly and posteriorly, front angles acute, hind angles rectangular or very nearly so as viewed from above; margin not at all uneven, base and apex with marginal lines, side margins rather wider than usual; punctuation rather fine and not very close, the punctures as a rule distant by from one to two times their own diameter, somewhat sparser at middle; on each side an arcuate row of three foveiform impressions, of which the anterior within the front angles is largest and best defined, the posterior one nearer the base than the side, small and sometimes absent. Elytral costæ moderate, punctuation similar to that of the thorax but more vaguely impressed; pygidium rather coarsely rugose; metasternum finely densely punctulate and moderately densely hairy; free angle of hind coxal plate produced outwardly in form of a rounded lobe, which is visible from a dorsal view point. Abdomen very finely sparsely punctate, the fifth and posterior half of the fourth segment rather densely punctate; spurs of hind tibiæ slender, arcuate, free; claws with an acute median tooth. Length 17-18 mm., width 6¾-7 mm.

Male.—Antennal club subequal in length to joints 2-7; abdomen vaguely narrowly impressed along the middle, penultimate segment with a transverse impression posteriorly which is feeble at middle; last segment slightly flattened; pygidium broadly convex.

Female.—Antennal club as long as joints 3-7, abdomen convex, pygidium broadly transversely impressed subapically.

Chiricahua Mts., Arizona.

I am indebted to Mr. Schwarz for the four examples (1 male, 3 females) from which the above description is drawn. The species is a very distinct one and does not resemble at all closely any previously described species of *Lachnosterna* with which I am acquainted. It possesses the characters which in Horn's synopsis define the *crenulata* group and may be placed at the end of that series, differing from all of them, and indeed from all known species of the genus in its prominent front thoracic angles, and in the form of the hind coxal plates. The terminal joint of the maxillary palpi may be best described as cylindro-ovate, differing more or less from all other species of the group, though nearest *aemula;* it is feebly impressed in the male, scarcely at all so in the female.

In the paper on *Listrochelus* by Dr. Horn,[*] the prolonged and acute free angle of the hind coxal plate is said to be a constant character in this genus, while in *Lachnosterna*, the angle is sometimes right, but never acute or prolonged. This is a mistake. Compare for instance *antennata, nitidula* and *tristis* of *Lachnosterna* with *disparilis, flavipennis* and *carminator* of *Listrochelus*, and the coxal angle will be found to be quite as prominent or even more so in the Lachnosternas. This structure then is no more distinctive than is the vertical carina or the ungual pectination, and there remains no single constant character for the separation of the two genera.

◆

Notes on Sesiidae.

BY HENRY ENGEL.

Sesia bassiformis Walker.

During the summer of 1905, the Messrs. Kahl and Klages collected a number of specimens of this species at Ohio Pyle, Pa. Previous to these captures my only record of *bassiformis* from this section was a specimen given me by Mr. Knechtel.

The Ohio Pyle specimens were taken in a field where Iron Weed grew in abundance, either resting on the leaves of these plants or flying about in the field. This note furnished a clue to locate this species in my collecting grounds about Pittsburg, Pa., during the summer of 1906. Extensive pasture fields, profusely covered with Iron Weed, are situated near my home, and late in 1905, I examined many of these plants and found the roots of a great many infested by larvæ.

---

[*] Trans. Am. Ent. Soc. VII, 1878, p. 138.

During early August, 1906, I closely observed the Iron Weed in a field every evening on my way home from work. I usually arrived there about 5.45 P. M. which would seem late in the day for collecting Sesias. But this field had the benefit of the late afternoon sun and on August 13th, I observed three specimens and captured two of them. The following evening and up to September 9th, numerous specimens were taken. Imagos were on the wing from 10 A. M. to sunset. Pairs were taken in copulation from noon to 6 P. M. In one instance a female was observed to deposit an egg on the under side of a leaf. The larva enters the stem from 1-3 inches above base and bores down into the roots. Pupation occurs in the galleries beneath the surface in the old part of the root-stock, about the end of July. Period of flight, August 13th to September 14th.

In August and September, 1907, while employed at the Merrick Museum, New Brighton, Pa., I collected several dozen specimens in the vicinity of that town. By October 22nd, several frosts had occurred and the Iron Weed plants were killed. I took up several infected root-stocks and found the larvæ in various stages of development, ranging from 12-18 mm. long. The following description was taken from the larger larvæ.

Length, 18 mm., head 1.60 mm., wide, bilobed, light chestnut brown. Mandibles and ocelli dark brown. Front of head sparsely covered with light brown hairs. Thoracic shield pale brownish. Body semi-translucent, watery white. A brownish dorsal shade broadening on the somites and in the intersections. An indistinct whitish stigmatal line. Spiracles oval, light brown. Thoracic legs concolorous, clouded with pale brown outwardly. Abdominal legs concolorous, claws circular, light chestnut brown. Tubercles not prominent, indicated by a short brown seta. Anal segment a little darker dorsally than ground color. Pupa is normal, light brown.

Food plant: *Vernonia*, Iron weed.

The food plant of *S. bassiformis* is given in the literature as *Eupatorium purpureum* Linn. or Joe-pie weed. This plant has been extensively explored by Mr. Bird, Mr. Merrick and the writer. While it is by no means free from insect depredations we have not observed it infested by the larva of *bassiformis* in this section.

Sesia pyralidiformis Walker.

This modest little species was encountered in a pasture field while I was searching for *bassiformis* on a very hot day in August, 1906. It was slowly flying along near the ground and settled on a dead daisy head. Several specimens were taken that day and a few more during later visits. All the specimens occurred in a comparatively small area which led me to the conclusion that its food plant would be among the plants in this field. About a month after I had taken the last specimen I went to this place and looked for its probable food plant. The only plants of any prominence were iron weed and boneset. As the former had disclosed a borer I commenced splitting the stems of boneset and soon observed the very neat gallery of a larva leading into the roots. Many plants were found to be infested but these larvæ were quite small, and after testing patches of boneset in different localities and finding these plants infested almost everywhere I concluded to wait until the following year to continue my observations.

During July, 1907, I discovered a patch of boneset in a field near New Brighton, Pa., in which about one-half of the plants harbored a larva. Several dozen plants were transplanted in a breeding cage, and on August 18th *Sesia pyralidiformis* disclosed its identity. About 30 specimens emerged from these plants, all appearing from 8-10 A. M. Copulation took place about one hour after emerging and lasted from 1 to 2 hours.

The imagos were very abundant in the locality where I collected these plants and many specimens were taken as well as observations made on their habits. On sunny days they are on the wing from 10 A. M. to sunset. Often a female will rest on a leaf for a while then move to the edge and by bending the abdomen deposit a egg on the under side of the leaf. In several cases I observed females depositing an egg on a leaf near the head of the plant. Most of the ova are laid on the leaves near the stem about 6 inches from the base. The larvæ enter the stems from 1-2 inches above the crown of the stock and bore into the roots. The following year they continue feeding in the roots and work up into the new stems for about 1-2 inches where they prepare a place for emergence by eating through the side of the stems. Pupation takes place in the gallery. The larvæ mature from July 15-30th. The first pupa was observed on August 2nd. The moths were observed from August 7th to September 13th. They are most abundant about middle August. These observations however, were taken from the material observed at large and the specimen taken on August the 7th must have been in the pupa state about middle July. The average length of the pupa state is about 20 days. A description of the early stages as far as observed follows:

Ova.—Straw-yellow, oblong in shape, depressed flat surface at top and base, ovally rounded at the ends. The lower half is plain, the upper half ornamented by white lines in the form of irregular hexagonal net-work. Length 0.75 mm. Width 0.45 mm. Height 0.35 mm.

Larva, last stage.—Length 14 mm., head 1.50 mm. wide, rounded, slightly bilobed, light chestnut brown shading darker to the mouth parts. Edge of mandibles and the ocelli darker brown. Antennæ and spinneret light brown. Head sparsely covered with pale brown hairs. Body and abdominal legs dirty white. Thoracic shield, thoracic legs and claws on abdominal legs pale brown. Tubercles inconspicuous, indicated by single light brown setæ, I shorter than II, setæ slightly longer on anal segment. Along dorsum a semi-transparent line is evident, most conspicuous in the intersections. Anal plate tinged with light brown.

Pupa.—Light chestnut brown, with the usual chisel-shaped process developed on head. Spines on segments rather profuse.

Food plant: *Eupatorium perfoliatum* Linn., Thoroughwort or Boneset.

Sesia spec?—A species allied to *Sesia rutilans* Hy. Edw. but differing in several respects was reared from a stock of Sneezeweed, *Helenium autumnale* Linn., collected at New Brighton, Pa., by Mr. Henry Bird. The specimen emerged August 10th, 1907.

Mr. Bird kindly donated the specimen to the Merrick Museum.

Additional Records of Tabanidae (Horse-Flies) of North Carolina.

By C. S. Brimley and F. Sherman, Jr., Raleigh, N. C.

In Entomological News for October, 1904, the writers published a list of 40 species of Tabanidae then known from North Carolina. Continued collecting since that time has added 20 other species, some of them new, and all but one of which have been named for us by Prof. Jas. S. Hine, to whom we are under renewed obligations. We have, therefore, now on record a total of 60 species for the State, two of which (No 40 of the 1904 list and No. 60 of the present list) have not yet been definitely located. *Tabanus allynii* has not been collected by the writers to date, but all the others have been taken by us or by assistants in the office of the junior author Specimens of nearly all are in our collections. A few records from Pendleton in 1895 are from collections made by Mr C. W. Johnson. Rev. A. H. Manee, at Southern Pines, N. C., has also collected somewhat in this family.

We have numbered these additional species consecutively with the 1904 list. The letters in parentheses after the name of a locality denote its geographical location in the State thus, E. eastern, W. western, C. central, E. C. east central, etc. We also append new records as to the geographical or seasonal range of some of the species mentioned in the 1904 list.

1. ADDITIONAL SPECIES.

41. **Chrysops cursim** Whit.

Raleigh (E. C.). June 7 to July 17; C. S. Brimley and R. S. Woglum.

Havelock, (Lake Ellis) (E.). June 1905; May, 1906; Brimley. Seemingly not a common species.

42. **Chrysops dimmocki** Hine.

Pendleton (N. E.). Early June, 1895; C. W. Johnson.

Havelock (E.). Late May, 1907; Brimley and Sherman.

43. **Chrysops fallax** O. S.

All our reports of this species are for the months of June and July.

Raleigh (E. C.). June 5 to 18; taken by Brimley and Woglum.

Pendleton (N. E.) Early July, 1895; C. W. Johnson.

Hendersonville (S. W.). June, 1907; Sherman.

Highlands (S. W.). July, 1906 and 1907; Sherman.

Blowing Rock (N. W.). July 20, 1904; Sherman. This species probably occurs throughout the State.

44. **Chrysops montanus** O. S.

Only two specimens of this have been collected.

Raleigh (E. C.). June 5 and 18, 1906; Brimley.

45. **Chrysops nigribimbo** Whit.

Havelock (E.). Taken rather commonly by both writers in 1905, 1906, 1607, from late May to late June.

46. **Chrysops parvulus** Daecke.

Our three specimens are from two mountain localities, *Hendersonville* (S. W.) June, 1907, and *Highlands* (S. W.) July, 1907; Sherman.

47. **Chrysops separatus** Hine.

The type and only specimen of this species was taken by C. S. Brimley at *Raleigh* (E. C.) April 18, 1906. Described by Prof. Hine in Ohio Naturalist, December, 1907.

48. **Chrysops sequax** Will.

A species of rather late seasonal range.

Raleigh (E. C.). Not uncommon from July 9 to September 9; Brimley.

49. **Chrysops shermani** Hine.

Highlands (S. W.). July, 1906; July, 1907. Common and annoying on horse; Sherman.

Marion (W. C.). Mid-July, 1907; Sherman.

50. **Tabanus annulatus** Say.

Our two specimens are from the eastern section.

Havelock (Lake Ellis) (E.). July, 1905. Specimens sent in by J. J. Ballard.

51. **Tabanus exul** O. S.

Our three records are all from the central part of the State and all in July.

Pluck (C.). July, 1903; S. W. Foster.

Southwestern Alamance Co. (C.). July, 1905; Sherman.

Charlotte (C.). Late July, 1907; Sherman.

52. **Tabanus fuscopunctatus** Macq.

Havelock (Lake Ellis) (E.). Late May, 1907; L. L. Smith

Southern Pines (S. E. C.). Mid-May and June, 1906; Rev. A. H. Manee,

53. **Tabanus hinei** Johns.

Havelock (Lake Ellis) (E.). Late May, 1907. Two specimens taken by C. S. Brimley.

54 **Tabanus lasiopthalmus** Macq.

Raleigh (E. C.). May 9, 1905; G. M. Bentley.

Havelock (Lake Ellis) (E.). May, 1906; Brimley.

55 **Tabanus longiusculus** Hine.

Raleigh (E. C.). Early July, 1903; Sherman

Lagrange (E.). Mid-July, 1907; L. M. Smith.

Southern Pines (S. E. C.). Taken by Rev. Manee.

56. **Tabanus megerlei** Wied.

Southern Pines (S. E. C.). April, 1905; Sherman, mid-April, 1906; R. S. Woglum.

57 **Tabanus mexicanus** Linn.

This crepuscular or nocturnal species has been taken only at three localities in the eastern and southeastern sections of the State.

Wilmington (S. E.). 1905; Woglum.

Wallace (S. E.). June 4, 1904; R. W. Collett.

Havelock (Lake Ellis) (E.). Late June and July; a number sent by J. J. Ballard.

58. **Tabanus superjumentarius** Whit.

Hendersonville (S. W.). June, 1907; Sherman.

59. **Tabanus trispilus** Wied.

Pendleton (N. E.). June 7, 1895; C. W. Johnson.
Cashiers (S. W.). July, 1907; Sherman.

60. **Tabanus** Sp.

Two specimens not yet identified but clearly distinct from any here recorded, have been taken at *Southern Pines* (S.E.C.), probably by Rev. A. H. Manee, and are now with Prof. Hine for study. The eyes are hairy.

2. NEW RECORDS ON GEOGRAPHICAL DISTRIBUTION.

Only such localities are given as materially extend the known range of the species in the State, beyond what was recorded in our 1904 list.

Chrysops brimleyi Hine.

Originally taken at *Raleigh*, this species has now been taken both east and west, and is likely distributed throughout the State.

Havelock (E.). May, 1906; Brimley.
Hendersonville (S. W.). June, 1907; Sherman.

Chrysops callidus O. S.

Same dates and localities as for the preceding.

Chrysops celer O. S.

Southern Pines (S. E. C.). Mid-May, 1906; Foster.
Hendersonville (S. W.). June, 1907; Sherman.
Highlands (S. W.). July, 1907; Sherman.

Chrysops lugens O. S.

Havelock (E.). Late June, 1905; Brimley.

Chrysops moechus O. S.

All our Raleigh records for this species as printed in the

1904 list properly belong to *C. niger*. One specimen of *moechus* has been taken at *Raleigh* (E. C.). Sept. 3, 1903; Brimley.

Lillington (E. C.). Early June, 1906; Sherman.

Hendersonville (S. W.). June, 1907; Sherman.

Chrysops niger Macq.

Probably distributed throughout the State.

Pendleton (N. E.). Early June, 1895; C. W. Johnson

Hendersonville (S. W.). June, 1907; Sherman.

Highlands (S. W.). July, 1907; Sherman.

Chrysops obsoletus Wied.

Pendleton (N. E.). June, 1895; C. W. Johnson.

Highlands (S. W.). July, 1907; Sherman.

Chrysops univittatus Macq.

This species, recorded in the 1904 list only from central and east-central parts of the State, has now been taken in a number of new localities indicating general distribution in the State.

Chrysops vittatus Wied.

Our present records show this species to be in all parts of the State—the 1904 list indicated only eastern localities.

Diachlorus ferrugatus Say.

At the time our 1904 list was written but one example of this species had come into our hands, but in June, 1905, the writers found it to be both abundant and annoying as *Havelock* (E.).

Tabanus americanus Forst.

Present records indicate this species to be of general distribution in the State.

Tabanus cinctus Fabr.

The males of this handsome species have a habit of hovering in the air in the same manner as the carpenter bees of the genus *Xylocopa*.

Southern Pines (S. E. C.). Early June and late May, [illegible] Rev. A. H. Manee.

Highlands (S. W.). June, 1907; Sherman.

Tabanus coffeatus Macq.

Formerly recorded only from Raleigh, but our present records indicate distribution throughout the State.

Tabanus variegatus Fabr.

Tabor (S. E.). September, 1905; Woglum.

Tabanus wiedemanni O. S.

Lagrange (E.). Early August, 1904; Sherman.

Sonthern Pines (S. E. C.). Early July, 1904, and early June, 1904; Rev. A. H. Manee.

3. SEASONAL RANGE OF COMMONER TABANIDAE AT RALEIGH, N. C.

The species are arranged in the order of their appearance in the year, beginning with the earliest-appearing forms and closing with those that appear latest in the season. Based on the observations of C. S. Brimley.

C. brimleyi, April to May 18, one on June 18.
C. niger, May 2 to June 13.
C. callidus, May 2 to Sept. 13.
T. carolinensis, May 2 to May 13.
T. pumilis, May 7 to Aug. 17.
C. celer, May 7 to May 13.
C. univittatus, May 7 to Sept. 9.
C. carbonarius, May 15 to June 15.
C. lugens, May 18 to Aug. 16.
C. flavidus, May 20 to Oct. 18.
T. lineola, May 25 to Sept. 18.
C. obsoletus, May 26 to Oct. 1.
C. vittatus, May 26 to Oct. 10.
T. fulvulus, May 28 to July 10.
T. cerastes, May 29 to June 20.
T. stygius, May 30 to July 10.
C. fallax, June 5 to June 18.
C. cursim, June 7 to July 17.
T. molestus, June 7 to July 20.
T. melanocerus, June 7 to July 17.
T. trimaculatus, June 17 to July 23.
C. fulvistigma, June 11 to July 25.
T. atratus, June 11 to Oct. 11.
T. coffeatus, June 13 to July 23.
T. americanus, June 19 to Aug. 18.
T. fronto, July 4 to Sept. 17.
C. sequax, July 9 to Sept. 9.
T. longus, July 14 to Sept. 13.
T. variegatus, Sept. 2 to Oct. 29.

◆

New North American Pachyrhina, with a Table for Determining the Species.

By R. W. Doane, Stanford University.

In working over the large series of *Pachyrhina* that have come to me from time to time I have found it desirable to revise Loew's table (Vehr. Zool-Bot. Ges. 1879, 513-516) to include the Mexican species and other species that have since been described. Believing that it may prove helpful to some, especially as Loew's table is not easily accessible to all, I give my table here together with descriptions of four undescribed species, including two of our most common California forms.

I have not seen specimens of *P. affinis* Bell. or *P. excelsior* Berg. and cannot from the descriptions select any characters which would not apply equally well to some of my specimens of *P. incurva* Lw. so these three species are placed together in the table until further study shall show some characters by which they may be separated. *P. occipitalis* Lw. occurs in two places as in the original table, as I find that desirable on account of the occiput being more or less shining, sometimes almost opaque.

1.	Thorax wholly black	2.
	Thorax not wholly black	3.
2.	Abdomen altogether black	**altissima** O. S.
	Abdomen reddish-yellow toward the base	**erythrophrys** Will.
3.	Thoracic stripes black	4.
	Thoracic stripes brownish or reddish, sometimes obsolete	18.
4.	Wings hyaline	5.
	Wings with a yellowish or brownish tinge	12.
5.	Anterior end of the lateral stripes curved	**incurva** Lw. **affinis** Bell **excelsior** Berg.
	Anterior end of the lateral thoracic stripes not curved	6
6.	Pleura without spots; occiput without a black spot	**virescens** Lw.
	Pleura with spots	7
7.	Pleura for the most part cinereous	**collaris** Say.
	Pleura not cinereous	8.
8.	Pleura yellow, with yolk-yellow spots	**ordinaria** O. S.
	Pleura variegated with brownish fuscous or blackish spots	9
9.	Head wholly black	**californica** n. sp.
	Head yellow, with a black spot on the occiput	10
10.	A small black spot between the antennæ; the black spot on the occiput does not reach over the vertex	**pedunculata** Lw.
	No spot between the antennæ; the black spot on the occiput reaches over the vertex	11
11.	Pleura variegated with several fusco-blackish spots, posterior margin of the eighth sternite of male only gently curved	**vittata** Lw.
	Pleura sulphur-yellow, with only one or two reddish-brown spots, posterior margin of the eighth sternite of male with a deep V shaped incision	**snowii** n. sp.
12.	Wings with a brownish or brownish-yellow tinge	13.
	Wings with a yellowish tinge, at least along the anterior margin	14.

13. Anterior ends of the lateral stripes of the thorax curved out.
lineata Scop.

Anterior end of lateral stripes not curved out . . . . . . **lugens** Lw.

14. Antennæ for the most part black or fuscous . . . . 15.

Antennæ yellowish, darker toward the tip . . . . . **consularis** O. S.

15. Pleura and metanotum spotted . . . . 16.

Pleura and metanotum without spots . . . . **noblis** Lw.

16. An opaque spot on the lateral thoracic stripes . . . . **nigrolutea** Bell.

No opaque spot on the lateral thoracic stripes . . . . 17.

17. Rostrum shining black above, yellow below . . . . **usta** O. S.

Rostrum yellow . . . . **mexicana** Macq.

18. Thoracic dorsum opaque . . . . 19.

Thoracic dorsum shining . . . . 22.

19. Stigma brown . . . . 20.

Stigma yellowish . . . . 21.

20. Lateral margins of the lateral thoracic stripes with three velvety-black spots. . . . . **elegantula** Will.

Lateral thoracic stripes without black spots . . . . **unimaculata** Lw.

21. Antennæ longer than usual . . . . **macrocera** Say.

Antennæ shorter than usual . . . . **tenuis** Lw.

22. A velvet black spot at the anterior end of the lateral thoracic stripe.
punctum Lw.

No velvet black spot at the anterior end of the lateral thoracic stripe . . . . 23.

23. Joints of the flagellum, except the basal ones, blackish . . . . . 24.

Joints of the flagellum in two colors . . . . 30.

24. Occiput altogether shining . . . . 25.

Occiput opaque, with a shining triangular spot in the middle.

25. Cross-veins clouded . . . . **unifasciata** Lw.

Cross-veins not clouded . . . . 26.

26. Front and occiput unicolorous . . . . **sodalis** Lw.

Front and occiput with a black stripe . . . . **occipitalis** Lw.

27. Thoracic suture colored with black at both ends . . . . 28.

Thoracic suture not colored black . . . . 29.

28. Posterior margin of the eighth sternite of the male with a rather deep rounded incision, the edges of which bear long yellow hairs.
occidentalis n. sp.

Posterior margin of the eighth sternite of the male straight or nearly so, yellow hairs much shorter and sparser . . **ferruginea** Fabr.

29. Stigma brownish-yellow . . . . **occipitalis** Lw.

Stigma blackish-brown . . . . **gracilicornis** Lw.

30. Joints of the flagellum black at the base . . . . 31.

Joints of the flagellum yellow at the base . . . . 35.

31. Occiput without distinctly defined shining triangle..**xanthostigma** Lw.

Occiput opaque, with a distinct shining triangle . . . . 32.

32. Costal cell colorless, stigma dark brown . . . . . . **abbreviata** Lw.

Costal cell colored, stigma yellowish-brown . . . . 33.

33. Thoracic suture tinged with black . . . . 34.
Thoracic suture tinged with reddish-brown . . . . **circumscripta** Lw.
34. Anterior end of lateral thoracic stripes curved . . . . **vulpiana** Berg.
Anterior end of lateral thoracic stripes not curved . . . **suturalis** Lw.
35. Antennæ with more than thirteen joints in both sexes . . . . . 36.
Antennæ with thirteen joints . . . . **brevicornis** n. sp.
36. Stigma yellowish-brown, apex of the wings not distinctly infuscated **eucera** Lw.
Stigma dark brown, apex of the wings distinctly infuscated. **polymera** Lw.

Pachyrina californica n. sp.

Yellow; head wholly black, opaque; sides of rostrum somewhat yellow; palpi black; first three segments of antennae yellow, the third sometimes darker toward the tip, other segments black, rather swollen at the base, with short stiff verticles; in the female, the 4th and 5th segments of the antennae are more or less yellow; ground color of the thorax bright yellow, shining, stripes shining black, median stripe broad, not extending back of the suture, lateral stripes reaching to the scutellum, not curved anteriorly; thoracic suture black in the middle; dorso-pleural suture black; dorso-pleural membrane yellow; collare yellow with median and lateral black spots; pleura black anteriorly, yellow posteriorly; scutellum and metanotum yellow with a median black line; halteres yellow, knobs brown; coxae black, femora and tibia yellow, black at the tips; tarsi blackish; abdomen yellow with rather broad black lines dorsally, ventrally and laterally, segments 6, 7, and 8 sometimes almost wholly black; hypopygium reddish brown; posterior margin of the eighth sternite of the male produced into two small triangular processes which bear dense tufts of rather long reddish yellow hair; posterior margin of the large ninth tergite blackish, with a deep semi-circular incision, posterior lateral margins with a small deep U shaped incision; ovipositor reddish black at the base, valves short, straight, blunt; wings hyaline with a faint whitish spot in the region of the stigma; veins, stigma, and more or less distinct spots just back of the stigma, over the origin of the praefurca and over the base of the basal cells brown; a faint hardly perceptible cloud in all the cells, petiole of the 2nd posterior cell as long as the anterior cross vein. Length, male, 15 mm, wing 13 mm, female, 18 mm, wing 14 mm.

Hab. Stanford University, Cal. Many males and females.

A single poorly preserved specimen from Pullman, Wash., seems to belong with this species.

Pachyrhina snowii n. sp.

Yellow, head orange yellow, shining, somewhat lighter below; the broad black shining band on the occiput and the vertex attenuated anteriorly; a small indistinct reddish-brown spot above each eye; rostrum yellow with a brown spot on each side close to the base; palpi brownish, lighter at the joints; first two segments of the antennae yellow, others wholly brownish-black, middle segments slightly excised below; thorax sulphur yellow; dorsal stripes black, shining, the median one slightly dilated anteriorly; collare orange-yellow in the middle, blackish or brownish on the sides; a small back dash in the dorsal-pleural membrane just before the base of the wing; pleura sulphur-yellow, variegated with one or two reddish-yellow spots; scutellum reddish-brown; metanotum yellow with a faint reddish-brown spot posteriorly; halteres brownish-yellow, darker toward the tip; coxae and base of femora light yellow; femora and tibia brownish-yellow, black at the tips; tarsi black; abdomen yellow with dorsal, lateral and ventral, interrupted black stripes; eighth and ninth tergites of male wholly black; eighth sternite black, the posterior angles and a narrow border of the deep V-shaped incision yellowish, posterior angles bearing a few yellow hairs of moderate length; appendages of the hypopygium yellow; eighth segment of female black, ovipositor reddish-yellow, upper valves long, slender, very slightly decurved at the tip, lower valves not reaching to the tip of the upper valves; wings hyaline; costal and subcostal cells with a slight yellowish tinge; stigma brown; second posterior cell sessile. Length, male 13 mm., wing 13 mm., female, 14 mm., wing 13 mm.

Hab.—Wyoming. One male, one female.

Much like *P. vittula* Lw. but may be distinguished by the fewer lighter markings on the pleura and particularly by the deep V-shaped incision on the posterior margin of the eighth sternite of the male.

Pachyrhina occidentalis n. sp.

Yellow; head opaque, orange-yellow above, much lighter yellow behind the eyes and below; occiput with an arrow-shaped brownish spot; rostrum, palpi and first three segments of antennae orange-yellow, remaining segments of antennae dark brown; palpi darker toward the tip; thorax light yellow, dorsal stripes brownish-yellow or reddish-yellow, broad, shining, the lateral ones expanding somewhat anteriorly; the sides of the collare, the coxae and irregular spots on the pleura, brownish or reddish-yellow; thoracic suture marked with black at both ends and with a black spot in the middle; three black spots along the dorso-pleural membrane, the first just back of the collare, the second a short distance in front of the wing and the third at the base of the wing; scutellum and metanotum with a broad, reddish-yellow stripe; halteres yellowish at the base, darker toward the tip, knobs brownish; femora and base of tibiæ brownish-yellow, tibiæ growing darker toward the tip; tarsi brown, terminal segments almost black; abdomen brownish-yellow, darker posteriorly, posterior and lateral margins of the segments but slightly darker; the eighth sternite of the male long, broad, conspicuous, the posterior margin with a rather deep rounded incision, the edges of which bear a conspicuous fringe of long yellow hair; posterior margin of the ninth tergite with a small V-shaped incision, the edges of which are black; ovipositor reddish-yellow, upper valves straight, tips rounded, lower valves not reaching the tips of the upper valves; wings hyaline; stigma brown, more or less distinct; second posterior cell sessile or with a very short petiole (in two of my specimens this cell is broadly sessile in one wing, and with a very short petiole in the other wing). Length, male, 11 mm., wing, 11 mm.; female, 15 mm., wing, 15 mm.

Hab.—Central and Southern California, Montana, Eastern and Western Washington, Nevada, Arizona. (type from Stanford University, Cal.) Many males and females.

This species is very like *P. ferruginea* of the eastern United States and doubtless is the one that has been recorded from California as *ferruginea*. The long, broad eighth sternite of the male with its deeply cleft, long-haired posterior margin at once separates it from *ferruginea* in which this sternite is only slightly curved or cleft along the posterior margin and is provided with much shorter sparser hairs. The specimens from Arizona and one of the Washington specimens have the anterior lateral margins of the median thoracic stripe bordered with brown and in some the anterior ends of the lateral stripes are also marked with brown. The brown spot on the occiput is sometimes quite indistinct, in other specimens it is well marked, sometimes drawn out into a narrow line anteriorly. In a few of the specimens the tip of the knob of the halteres is yellowish. The palpi are sometimes wholly yellow and the 4th, 5th, 6th segments of the antennae of the female are usually more or less yellow.

Pachyrhina breviorcornis n. sp.

Yellow, head yellow, with a brownish tinge and a small triangular brown spot above, lighter behind the eyes; rostrum yellow, brown on the sides palpi yellow; antennae with thirteen segments, first and second wholly yellow, third elongate, basal half yellow, distal half brown, segments four to twelve brown with the basal one-fourth or less yellow, all gently excised below, with a dense soft pubescence and a whorl of moderately long hairs, only four or five hairs in each whorl, thirteenth segment short, conical, wholly brown; thorax yellow; dorsal stripes reddish-brown; pleura light yellow, a spot below the wing brownish yellow; scutellum yellow with a brownish tinge above; metanotum yellow; halteres brownish, lighter at the base, knobs darker; coxae brownish yellow; legs yellowish-brown, tarsi and tips of femora and tibiæ darker; abdomen brownish yellow, darker posteriorly, with dorsal, lateral and ventral rows of black spots, those on the dorsum less distinct posteriorly, hypopygium small; eighth sternite with a rather deep U-shaped incision; wings with a faint yellowish tinge, costal and subcostal cell yellowish, stigma darker yellow; second posterior cell sessile. Length, 14 mm., wing 13 mm.

Hab.—Battle Creek, Mich. One male.

Somewhat like *P. eucera* Lw. but antennae only thirteen segmented, last segment shorter and the middle segments not so deeply excised. The second posterior cell in *eucera* is subject to considerable variation, in some of the specimens before me this cell is broadly joined to the discal cell, in others it has a short petiole, in a few the petiole is as long as or longer than the anterior cross vein.

◆ • ◆

Some Oxybeline Wasps from New Mexico.

By S. A. Rohwer and T. D. A. Cockerell.

Oxybelus fossor n. sp. ♀ Length 4½ mm. Head and thorax deeply and densely punctured, the punctures on the vertex sparser, mesothorax shining but very strongly punctured; face, cheeks and pleura with silvery pubescence; prothorax not strongly carinate; mesonotum without depression; scutellum and postscutellum with medial longitudinal carina; mandibles except tips, narrow margin of prothorax at sides, tegulae, squama and two spots in front and spine white; antennae (flagellum darker above), legs except coxae, four anterior trochanters, line on intermediate femora above and the anterior femora above rufous; abdomen clear red, shining, sparsely punctured (the punctures denser beyond the second segment), thinly clothed with white pubescence; a broad band on first abdominal segment squarely interrupted in the middle, a linear rudimentary band on second and third segments creamy white; the medial depression of first segment is indistinct. Wings milky hyaline, nervures pale ferruginous.

Hab.—Mesilla Park, N. M. College campus, June 7, '99 (Ckll.). "Digging in sand."

Related to *O. abdominalis* Baker, from which it may be known by its larger size, shining abdomen, with the punctures on the second segment more widely separated; the pale ferruginous, instead of dark brown, venation and the narrower spine.

Oxybelus townsendi n. sp. ♂. Length 5 mm. Head and thorax rather densely but finely punctured, covered with fine silvery pubescence which is denser on the face, cheeks, prothorax and upper posterior face of metathorax; clypeal process prominent; mesonotum without depression; scutellum and postscutellum carinated, postscutellum not so strongly; squama rising from side of postscutellum, short, strongly curved and sharply pointed; spine rounded at tip and slightly broader, grooved above until apical third; areas of the metathorax well defined, posterior face surrounded by a ridge, on posterior face below spine is an oval shining fovea; abdomen finely punctured, first segment somewhat truncate at base, the medial depression broad but distinct, second segment with a narrow transverse basal depression. Color black; mandibles at tip piceous; antennae, mouth parts, base of tegulae, anterior tibiae and tarsi dull rufous; eyes (dry) pale yellowish brown; squama pallid; first, second and third abdominal segments on apical margin dull white; first on each side with a line of yellow; a yellowish spot on base of hind tibia; three apical segments and narrow apical margin of the one before rufous; abdomen with sparse silvery pubescence. Wings hyaline, nervures brown.

Hab.—Las Cruces, N. M., August 30. Flowers of *Solidago canadensis*. Dedicated to Prof. C. H. T. Townsend, who collected it.

This species has its nearest ally in *O. similis* Cress., from which it may be separated by the different shape of the postscutellum, its being feebly carinated; fovea in face of metathorax not produced beneath, the abdomen evenly punctured throughout; pubescence on mesothorax silvery and other color characters.

Accompanied on the flowers by *O. sparideus*, *O. emarginatus* and *O. cornutus*.

Belomicrus cladothricis Ckll., on *Croton*, between Rowe and old Pecos Pueblo, N. M., Sept. (W. P. Ckll.). This extends the range a long distance northward.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., APRIL, 1908.

"Let us never forget the debt we owe to the pioneers of science. The results of the dearly bought experience of the past form a solid foundation of fact upon which we now stand firmly and confidently, to enter upon new fields of investigation. The status of entomological research to-day is far different from what it was even ten years ago. The number of devotees to these attractive studies is easily a hundred-fold greater than then."—JAMES FLETCHER.

Entomology is doing great things but we see no busts of entomologists in the Halls of Fame. At the meeting of the A. A. A. S., in New York, it was suggested to the President of one of our great scientific institutions that the Hall of Fame in the American Museum of Natural History, should contain a bust of Thomas Say, whereupon he said he had never heard of such an individual. Dr. Fletcher is perfectly right in what he says, and we all honor those who have blazed the trail, but few honors have come to entomologists. Perhaps we should rise superior to what may be termed empty honors and glory in the knowledge of the value of our study and its great interest to mankind, now and for what it will be in the future.

Entomological Literature.

DIE HYMENOPTEREN MITTELEUROPAS, NACH IHREN GATTUNGEN UND ZUM GROSSEN TEIL AUCH NACH IHREN ARTEN ANALYTISCH BEARBEITET. By Dr. Otto Schmiedeknecht. Pp. 804, with 120 text figures. (Jena 1907, Verlag von Gustav Fischer.)

The present extensive treatise although it does not deal directly with the fauna of North America, is one which will be very useful to students of Hymenoptera in this country. Since the publication of Cresson's Synopsis twenty years ago, no single comprehensive work has been available for the use of American entomologists desiring to begin the study of this complex and interesting group of insects. During this time many new genera have been discovered, and other European ones found in America, until at the present time there is a great deal lacking in the synopsis which will be in great part supplied by the new work.

Professor Schmiedeknecht has classified all of the families down to genera, and as the genera occurring in the United States and in central Europe are in most cases very nearly the same, this part of the volume may be applied to the classification of our own fauna with the most gratifying results.

On account of the large number of species included in the parasitic groups, these have been in most cases only generically classified, although specific tables for genera of special interest like *Ichneumon* and *Gasteruption* are given in complete form. Specific tables are however given for all the wasps and bees and the Chalastogastra, but they are of no aid to American entomologists, for an extremely small number of species are common to the two continents.

On the whole the work seems to embody the current views of the foremost workers in each group, which allows of a much more representative and conservative treatment than would otherwise have been possible. Only twenty-two families are recognized. The author's own familiarity with what is no doubt the most difficult family, the Ichneumonidæ, makes this part of the book especially valuable.

Each family and other of the larger groups is described at some length, with figures of wings and other diagnostic parts and also with references to available literature.

In short, the volume is a storehouse of much that will prove useful to American as well as European entomologists, and should be in the hands of all actively interested in the classification of these insects.—C. T. BRUES.

◆

MESSRS. HEBARD AND REHN are trying to tell from the appearance of the map of the United States where the most new species of Orthoptera may be found. They are planning an expedition

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

MR. H. W. WENZEL is contemplating a collecting trip to the Muskoka Lake region in search of Coleoptera.

THE Report of the Entomological Society for Ontario, for 1907, is an interesting and valuable document. Great activity is being shown by our Canadian brethren.

PROFESSOR V. L. KELLOGG, of Stanford University, will be in Europe from April to December of this year. His address is, care French, Lemon & Co., Florence, Italy.

DR. P. P. CALVERT delivered an interesting course of lectures in the Ludwick Institute course, at the Academy of Natural Sciences of Philadelphia. His subject was "Studies in the Natural History of Mexico and Central America."

LIST OF PUBLICATIONS OF THE BUREAU OF ENTOMOLOGY, Washington, D. C. Under this title, Circular No. 76 of the Bureau, revised to March 1, 1908, is republished with 28 pages, an increase of 7 pages over the first edition. It is a most helpful guide through the maze of Annual Reports, Bulletins—old, new and technical series, Circulars—first and second series, Special Reports, Bulletins and Reports of the U. S. Entomological Commission, Insect Life, Farmers' Bulletins relating to Entomology, Yearbook articles, Miscellaneous Reports and other publications of the variously organized entomological activities of the U. S. Government. It has been compiled by Miss Mabel Colcord, Librarian of the Bureau.

◆

ERRATA VOL. XIX.

Page 2, line 16, for .023, read .23.
" 2, " 17, for .014, read .14.
" 3, " 11 from bottom, for 70 read 20.
" 96, " 8, for ♀ read (♀).
" 97, " 16, after pronounced, insert tubercle, so as to read pronounced tubercle.
" 97, " 22, should read, This species differs from a typical *Xanthacrona*, etc.
" 99, " 19, for (*acrotoxa*) read (*Acrotoxa*).
" 126, for *Cyrtophillites* read *Cyrtophyllites*.
" 126, second line of description, for 55 mm. read 50 mm.
" 126 and 127, for *Lythymnetes* read *Lithymnetes*.
" 127, for *Tetrachoncha* read *Tetraconcha*.

Doings of Societies.

The Brooklyn Entomological Society met January 9th, seventeen members being present. Of the old officers, President J. L. Zabriskie, and Recording Secretary, G. P. Engelhardt, declined re-election. The following new officers were elected unanimously:

President, R. F. Pearsall; Vice President, E. L. Graef; Treasurer, C. H. Roberts; Recording Secretary, R. P. Dow; Corresponding Secretary, A. C. Weeks; Librarian, J. J. Levison; Curator, Geo. Franck; Delegate to the New York Academy of Sciences, John B. Smith; Field Committee, appointed by the Chair.

Mr. Weeks read a paper upon "The Economic Value of the Vespertilionidæ (Insectivorous Bats)" with suggestions as to their preservation and propagation, and gave a summary of his observations upon a large colony of these creatures which were domiciled in the roof of his summer residence on Long Island last year, together with his opinion that as destroyers of noxious insects they were superior to the whippoorwill and nighthawk, and the several species of owls and nocturnal animals and reptiles. Nothing could be said to their prejudice, while moreover they were free from the faults of many partially insectivorous birds, in that they did no injury to poultry or other useful birds, fruit or vegetation. They were practically on the alert throughout each night during the insect season and by hibernation or emigration during the cold period required no artificial care. Bats are able to capture many species of injurious moths which in both the larval and mature stages are so well concealed during the day that they cannot then be readily taken. Several methods of constructing artificial shelters for refuge to bats and their propagation were suggested to take the place of natural hiding places in hollow trees which were now rapidly disappearing, with a recommendation that bats be protected by law and that the U. S. Department of Agriculture, through the co-operation of its Divisions of Biology and Entomology cause a formal and detailed investigation to be made along the lines set forth in the paper, and if deemed of sufficient importance, that a Farmers' or other Bulletin, embodying the results be prepared and distributed.

Professor J. B. Smith noted that bats keep close to the woods and take their prey entirely on the wing, hence were not likely to be valuable as destroyers of the gypsy moth, the brown tail and female moths generally, before the egg laying. Mr. Dow had observed while collecting under electric lights, that a majority of moths caught by the bats were arctiids.

Mr. Olsen then related a beautiful example of maternal solicitude. He had encountered a party of boys stoning a wood bat, *Vespertilio novaeboracensis*. The animal neither flew nor resisted but held her wings folded around her body. On rescuing her, he discovered a new born young one within the sheltering wings. The helpless mother had stayed to face death for its sake. Olsen made a nest of leaves in his hat. On arriving home, he found the mother and three young.

G. P. ENGELHARDT, *Secretary*.

At the Twentieth Anniversary Meeting of the Feldman Collecting Social, which was held at the home of the Secretary, at Wissahickon, Philadelphia, Pa., December 28, 1907, the following members were present: Dr. Henry Skinner, Prof. Philip P. Calvert, Philip Laurent, Albert Hoyer, Henry W. Wenzel, Dr. D. M. Castle, Frank Haimbach, Theo. H. Schmitz, Henry S. Harbeck, Erich Daecke, Wm. S. Huntington. H. A. Wenzel, H. A. Kaeber, George M. Greene and Henry L. Viereck, also Mr. Chas. Greene, visitor.

Letters were read from Chas. W. Johnson and C. Few Seiss, members, and Wm. Beutenmüller, Edgar L. Dickerson, John A. Grossbeck and W. D. Kearfott, to whom invitations had been extended, expressing regrets at not being able to attend Anniversary meeting.

Professor Calvert read a paper by Vernon E. Shelford, of the University of Chicago, on the distribution of Tiger Beetles and their egg-laying habits. The subject was discussed by the members, more particularly by Mr. Henry W. Wenzel and Dr. Henry Skinner. Prof. Calvert spoke about *Leptinotarsa*, and said that in different years the species varies according to Dr. Tower.

Mr. Daecke exhibited specimens of *Pamphila arogos* Bdl & Lec. taken at Brown's Mills Junction, N. J., July 21. 1907 This species has also been taken at Lakehurst, N. J. (Davis), before which it had only been reported from Gulf States, Iowa and Nebraska. The geographical distribution of Pamphilas was discussed by the members.

The meeting then adjourned, and after a musical program furnished by Mr. Haimbach, Jr., a collation was served, which was very much enjoyed by all those present, and upon which occasion the President read an address to the members; addresses then followed by each of those present and the Twentieth Anniversary Meeting was pronounced a grand success.

FRANK HAIMBACH, *Secretary*.

At the meeting of the Feldman Collecting Social held January 15, 1908, at the residence of Mr. Henry W. Wenzel, No. 1523 S. 13th Street, Philadelphia, there were thirteen members present.

The following officers were nominated and elected to serve during the year 1908: President, Erich Daecke; Vice President, Henry S. Harbeck; Treasurer, Henry W. Wenzel; Secretary, Frank Haimbach; Assistant Secretary, George M. Greene.

The President read his annual address, which was ordered incorporated in the minutes.

The Treasurer's report was read, and ordered filed

The Secretary submitted a verbal report, which was accepted.

Mr. Schmitz presented a specimen of *Thecla halesus* Cram., taken in a room of his home on January 8th. It was suggested that the pupa of this insect was brought North in a fruit basket, and as January is its time of emergence in the South its presence here was only accidental.

Dr. Castle spoke of his trip last summer to the mountains near Harrisburg, Pa.

Mr. Wenzel exhibited H. A. Wenzel's collection of Anthicidae, from Southern Arizona, among which are probably several new species of *Xylophilus*.

Mr. Greene reported the finding of *Hololepta* sp. and *Cucuja flavipes*, under bark, in the early part of this month.

Mr. Seiss spoke about *Eros aurora*, and said that only one specimen had been seen and taken at Island Heights, N. J., on May 5, 1907, and that very few were seen in May, 1906, while hundreds were taken in April and May, 1905.

Mr. Wenzel thought that the large gathering of *Eros aurora* was not caused by food, but probably by the presence of a number of females; the speaker had noticed other species of Lampyrids under similar conditions.

Dr. Castle said that he collected one or two specimens of *Telephorus longulus* Lec. at Enterprise, Fla., and that no others were seen at that time, while several days after he took several thousand with one sweep of net.

Mr. Harbeck exhibited a specimen of *Trichocera regelationis* Linne. This is a European species and, according to Aldrich, has only been taken in this country, in Greenland, and British Columbia. It was taken in numbers on November 19, 1907, by Messrs. Philip Laurent, at Mt. Airy, and F. M. Arthur, at Logan, Pa.

Mr. Bland described the nature of the country about his New Jersey home at Little Silver, Monmouth County, the chief industry of which place is floriculture.

FRANK HAIMBACH, *Secretary*.

At the meeting of the Feldman Collecting Social held February 19, 1908, at the residence of Mr. H. W. Wenzel, No 1523 S. 13th Street, Philadelphia, thirteen members were present, and Messrs. Kearfott and Classen, visitors.

Mr. Kearfott exhibited his card index system, upon which he is collecting data pertaining to the Tortricidae of the world The original descriptions of genera and species are given, as well as venation, head and palpi, and other structural details.

Mr. H. W. Wenzel exhibited a number of specimens of *Macrobasis ochrea* from Southern Arizona, all in coition Each male had selected a female of exact size of itself; the species has a tendency to vary greatly in size.

Prof. Smith said that he would make a microscopical examination of the sexes, and report his findings at the next meeting.

Among the Lepidopterous collection from Southern Arizona, made by Messrs. Wenzel, Jr., and Kaeber, which Prof. Smith determined for Mr. Haimbach, the Professor pointed out as of especial interest, specimens of *Mamestra pallicauda* Sm.; this species has a white anal tuft, being the only one of this genus with that characteristic.

Mr. Daecke exhibited specimens of *Pamphila dion* Edw taken at Brown's Mills, N. J., September 15, 1907.

FRANK HAIMBACH, *Secretary*

A meeting of the Newark Entomological Society was held January 12, 1908, in the Turn Hall annex, with seventeen members present.

Mr. Samuel Henshaw, of Cambridge, and Mr Otto Buchholz, were tendered thanks for generous donations toward the library.

Under the topic of "Variation in Insects" Mr Buchholz exhibited a series of over sixty specimens of *Arctia nevadensis*, showing all variations and named varieties

Mr. Brehme exhibited specimens of *Neonympha henshawi*.

illustrating extremes in coloration. Mr. Grossbeck showed a box of Geometrids and spoke of the great amount of variation many of the species displayed. Especially interesting was a specimen of *Therina fiscellaria,* in which the two normally widely separated cross-lines anastomosed and parted at the point of juncture, thus forming a quadrangle with the costa and a triangle with the inner margin. A similar case was that of *Mesoleuca gratulata,* where the basal and outer fields joined centrally, having a small white costal and inner marginal spot to represent the usual broad median area. Mr. Broadwell had a fine series of *Telea polyphemus,* showing the gradual variation from pale yellow to dark reddish individuals. JOHN A. GROSSBECK, *Secretary.*

A meeting of the Newark Entomological Society was held February 9, 1908, with eighteen members present and Mr. Henry Dietz, of New York, a visitor.

Mr. Brehme read a paper entitled "Notes on Some Saturniidæ" in which he spoke of the large percentage of dead caterpillars in the cocoons he had collected last fall. *Samia cecropia* fared worse than all other species in this respect, scarcely 4½ per cent. containing live pupæ, and, of the dead ones only 1 per cent. of those examined were infested with parasites. *Telea polyphemus* unlike *S. cecropia* died mostly in the larval stage, and just before the season of pupation hundreds of larvae could be seen hanging limp from the branches of their food-plants. Of those that succeeded in forming cocoons 60 per cent. were invalid, and, as in the case of *cecropia,* died before pupating, though the inner as well as outer wall of the cocoon was fully formed. *Promethea,* on the other hand, seemed not to be affected by disease at all and even escaped to a remarkable degree the usual infestation of parasites. *Cynthia* was not inclined more in one direction than in another and the percentage of good cocoons remained at a par with former years.

In discussing the paper Mr. Erb bore out Mr. Brehme's statements in regard to the dead and dried up larvae in the *cecropia* and *polyphemus* cocoons. Mr. Doll said that infestation was a purely local one, since in one locality on Long Island, all of nine hundred to one thousand *cecropia* cocoons were dead, while in another only a short distance away, he secured over sixteen hundred good ones. Mr. Zaiser related a somewhat similar experience where at Canarsie, Long Island, all those cocoons of *cecropia* collected close to the sea shore, contained living pupæ, while those some distance back from the coast, proved to be dead. He thought the influence of the salt air might have been responsible in keeping the parasites away from the immediate shore district. In neither of the last two instances were cocoons examined to any extent, so that it was impossible to say whether the mortality was due to parasitism or disease. Mr. Kircher remarked that invariably cocoons (*cecropia*) attached to the branches of trees were good, while those at the base of the tree trunk were bad.

Mr. Angelman cited the note on *Erebus odora* in the February issue of the NEWS, and remarked that many more specimens were taken in western localities than in eastern ones, a fact probably due to the moths travelling northwardly from Mexico, along the range of the Rocky Mountains, and thence scattering to the lower lands. He thought it not beyond the bounds of possibility, however, that the insect should breed in the territory where it was found. Mr. Doll spoke of the abundance in which the species occurred at Brownsville, Texas, where during the day a dozen or more would gather on the walls of the hut assigned to him as a temporary habitation. Mr. Buchholz said that Mr. Kemp had a similar experience in the West Indies, where the insects would actually come to the dining table, attracted by the odor of beer. Mr. Doll said he found a single larva at Brownsville, and believes that it is a general feeder on low plants. The recorded food-plant, fig, does not occur at Brownsville.

JOHN A. GROSSBECK, *Secretary*

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Geometridae wanted, named or unnamed, particularly from the Northwest, Arizona, Montana, Idaho, North Carolina, Texas and Florida. Write first giving quantity and price. Will buy or exchange. Wm. H. Broadwell, 209 Plane St., Newark, N. J.

Will exchange living pupae of *E. imperialis, P. ajax troilus turnus, D. hylaeus* and many others for exotic material.—Geo. H. Hosenfelt, 3656 Salena St., St. Louis, Mo.

Wanted, the coming season for cash or exchange, a large number of living pupae, strong and healthy, of all Diurnal Lepidoptera and Noctua (*Papilios, Actias, Attacus*), etc. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

I desire to buy original collections of beetles from North, South or Central America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline, Mass.

Wanted.—A large number of all species of *Plusiotis, Prionus californicus, Derobrachus geminatus, S. cessus, julianus, Dynastes granti, Tetracha carolina, Pasimachus mexicanus,* all species of Cincidelidae and all other big beetles (Coleoptera) for cash or exchange. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

The undersigned, with a view of making as complete a State list as possible, desires to communicate with anyone who has collected Michigan butterflies or made notes upon the same. All such are asked to write.—Dr. W. W. Newcomb, 347 Trumbull Ave., Detroit, Mich.

Coleoptera for Exchange.—Canadian Coleoptera in papers, in every family, for North American ones. List sent on demand. Also a large number of exotic Coleoptera.—J. A. Jean, C. S. V., Ville St-Louis, Montreal, Canada.

Indian Insects in all orders. Specimens of *P. mayo, Kal. albofasciata, Hestia cadelli,* etc., from Andaman Islands, and *T. imperialis, A. camadeva, Phylliums, Phasmids* and live cocoons from Darjeeling and Assam. —A. Meik, 4 Convent Road, Entally, Culcutta.

Lepidoptera.—I would like to correspond with those who expect to collect for cash in new and little known regions, South and West, during the coming season.—John L. Healy, 312 City Hall, Chicago, Ill.

Coleoptera.—Nine double boxes containing named beetles to exchange for perfect Japanese gold fish.—Aug. Schmidt, 845 E. Russell Street, Philadelphia, Pa.

For exchange.—Named Coleoptera, *Cat relicta, bianca, phrynia* and *S. columbia.*—A. W. Andrews, 186 Lothrop Ave., Detroit, Mich.

I have for exchange fine *Parnassius apollo, delius; Arg. dia, adippe, amathusia, pales; Van. io, urticæ;* many Erebiæ; *Sat. hermione, circe, alliona; Lycæna bellargus,* etc. Wanted cocoons of *cynthia, promethia,* etc., pupæ of *ajax, turnus, troilus, cresphontes, myops, geminatus* and others.—J. W. H. Harrison, 181 Abingdon Rd., Middlesbro' England.

Noctuidæ wanted in exchange. Am especially in need of a good series of *Mamestra nimbosa* at present. Have only Noctuidae to offer.—F. H. Wolley Dod, Millarville, Alta, Canada.

Would like to exchange 50 named species of European Coleoptera for North American species not in my collection.—R. J. Crew, 72 Sarah St., Chester, East Toronto, Canada.

Will collect micro moths and larvæ from this locality.—G. R. Pilate, Mills College P. O., Cal. Enclose stamp for answer.

Will purchase or exchange *Catocala* of Missouri for a copy of Holst's Monograph on the genus *Catocala*.—Ernst Schwarz, 6310 Newstead Ave., St. Louis, Mo.

Exchange.—Nine double boxes named Coleoptera and a number of Entomological papers; would exchange for perfect Japanese gold fish.—Aug. Schmidt, 854 E. Russell St., Phila.

INSECTS OF NORTH CAROLINA

I am desirous of securing accurate data concerning occurrence of all species of insects in this State. Correspondence desired with parties or institutions having North Carolina material. Willing to pay for accurately prepared lists of any considerable number of species. Correspondence wanted with parties desiring material in certain groups from this State. Will gladly give suggestions to persons desiring to find suitable collecting grounds in this State for work at any season. In short, want the varied and interesting entomology of this State to be known and recognized by entomologists, and willing to assist in every way to make it known and get it recorded. About 300 miles of coast line and numerous mountain ranges and peaks 5000 to 6700 feet elevation; touches of subtropical and boreal faunas and all intergradations. In writing mention this advertisement.

FRANKLIN SHERMAN, JR., Entomologist
State Department of Agriculture, Raleigh, North Carolina

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,
6, Gunterstone Road, West Kensington, London, W.
Cat. No. 17 for 1908 now ready: mailed free on demand.

The only dealers' list giving authors' names throughout. 100 named specimens [illegible] ex Assam, 40 different species in papers, including *Papilios*, [illegible] etc., mailed free on receipt of Post Office Order $4.00. Explanatory Catalogue with over 300 descriptions and many interesting notes 12 cents.

PARCELS SENT ON APPROVAL FOR SELECTION.

FOR SALE. COMPLETE SET OF EDWARDS' BUTTERFLIES
Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

1,000 PIN-LABELS, TWENTY CENTS!

[illegible]

Orders must be [illegible] and no order will be [illegible]

C. V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

[illegible]

LEPIDOPTERA. I would like to correspond with those who expect to collect for cash in new and little known regions, South and West, during the coming season.

JOHN L. HEALY, 312 CITY HALL, CHICAGO, ILLINOIS.

FOR SALE

The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, .25; *C. arizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. hornii*, .50; *Pasimachus mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. arizonicus*, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Monilema gigas*, .40; *Oncideres tessellatus*, .75; *Leptostylus yuccæ*, 50.; *Urodera crucifera*, 20; *Nodonota arizonica*, .25. Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus epigona*, .50; *Oxycnemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia alata*, .40; *Spragueia plumbifimbriatus*, 25; *Hatima zethus*, .75; *Triprocris rata*, .30; *Gingla latercula*, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North American insects of all orders for sale, or exchange furnished on application.

F. H. SNOW - - - LAWRENCE, KANSAS

The Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

Cocoons of HYPERCHIRIA PAMINA Neum.

and Var. AUROSEA Neum.

ARIZONA. FOOD PLANT, OAK. PRICE, $1.

Otto Buchholz, 382 Littleton Ave., Newark, N. J.

New Arrivals from Mexico, South Brazil and Java

Papilio pilumnus, ♂, 1.50, ♀, 2.50; *Pap. asclepias*, ♂, 200, ♀, 4.00; *Pap. pharnaces*, ♂, 1.00, ♀, 1.50; *Morpho æga*, perfect, ♂, 1.00; *M. epistrophis*, ♂, 60c., ♀, 1.00; *Caligo martia*, ♂, 75c., ♀, 1.00; *Citheronia cacicus*, ♂, 75c., ♀, 1.25.

100 perfect specimens from Mexico or Brazil, with 10 *Papilio*, 7.50, all correctly named.

100 from Java, with 15 *Papilio* (*coon*, *achates*, etc.), *Kallima inachis* or *paralecta*, fine *Euplœa* and large *Hestia* species, all correctly named, 7.50.

From Celebes, *Actias isis* var. *lathonia* (hind wings with tails 9 in. long), expanded, 6.00.

Mexico cocoons, *Attacus orizaba*, 15c.; *Lagoa ornata*, 10c.

Living caterpillars of *Arctia nais* and *arge*, 1.00 per dozen.

O. FULDA, 816 BROADWAY, NEW YORK

When calling at my New York Store, mention News to get special prices.

FOR SALE:—PSYCHE Complete to end of Thirteenth Vol. (1906). A fine set, bound in morocco, with the exception of last two volumes. Price $50. for the set.

PHILIP LAURENT, 31 East Mt. Airy Avenue, Philadelphia, Pa.

The Butterflies of the West Coast

A new book. Text, descriptive and critical, of all known species, illustrated with thirty two full page plates in best modern photographic color work, with nearly a thousand figures, in 180 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practically out of print; is not in any dealers' stock, and only a few copies now remain in the author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAST

An abridgement of the above, consisting of the full set of plates as issued in that book, with names of all species printed on pages facing the plates, but with no descriptive text; issued as the best possible substitute for that more expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book address the author

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

WILLIAM J. GERHARD

SCIENTIFIC BOOKS

2209 CALLOWHILL STREET

PHILADELPHIA PA U S A

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia [illegible] Complete.

[illegible] Scarce $[illegible]

[illegible] parts [illegible] No. [illegible] $[illegible]

Strecker, H. Lepidoptera, Rhopaloceres and Heteroceres [illegible] 15 parts and

Supplement [illegible] 1872 [illegible] colored plates. Scarce $[illegible]

Say. [illegible] North America

[illegible] Cloth [illegible] colored pls. $[illegible]

Saussure, H de [illegible] famille des Vespides. I. Guepes solitaires [illegible]

[illegible] Euméniens [illegible] 22 colored plates $[illegible]

II. [illegible] Vespides [illegible] pls. $7[illegible]

III. Monographie des Masarides [illegible] plates $2[illegible]

Muller, H [illegible] Blumen durch Insekten [illegible] 1873. With Weitere

Beobachtungen, 3 parts 1879-82 $[illegible]

URNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

tor, E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec. Asso. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rouge, Louisiana

Advisory Board	L. O. Howard S. A. Forbes	James Fletcher H. A. Morgan	Herbert Osborn H. T. Fernald

bi-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

rms of Subscription:—In the United States, Cuba and Mexico, two dollars annually in advance; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

URNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

BUTTERFLIES AND MOTHS

OR SALE, CHEAP—A collection consisting of nearly 3000 named cimens representing an excellent lot of interesting exotics, as well as a good ies of North American species, both diurnals and nocturnals.

red. M. Mueller, 167 Evanston Ave., Chicago, Ill.

SPECIAL OFFER

y American Sphingidae, mounted; 30 different species (inclusive **Phalus linnei, Ph. rustica, Sph. kalmiae, Mar. modesta, Prot. ochus,** etc.	$10.00
pilio blumei, India, in paper	1.20
" " mounted, incl. box	1.50
ctenolus lecidas, Calif., in paper, each	4.50
plagmia ulalumae, on pins, each	2.75
use of **Cal. angulifera** per dozen	4.00

THE KNY-SCHEERER CO.

pt. of Natural Science, 404 West 27th Street, New York

OVA SCOTIAN LEPIDOPTERA.

Beautifully Mounted, in very fine condition, fully named and dated.

specimens of 200 species, Catalogue value $65.00	**$40.00**
" 100 "	**20.00**
" 100 "	**10.00**
" European Lepidoptera, on pins	**5.00**

2500 specimens, Nova Scotian, to choose from. Expressage extra.

OHN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER CO

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YORK.

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.
K.-S. Section Cabinets.
Schmitt Insect Boxes.
K.-S. Lepidoptera Boxes, Coleop
and Duplicate Boxes
K.-S. Screw Handle and Ameri
Nets.
The Asta Insect Pins:
White, 60c. per 1000.
Black, 70c. per 1000.

Catalogue II: Entomological Supplies
Application.

THE KNY-SCHEERER CO

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPOSIT
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect condition.
Single specimens and collections illustrating mimicry, protective colora
dimorphism, collections of representatives of the different orders of insects,
Series of specimens illustrating insect life, color variation, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect boxe
Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

P. C. Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

MAY, 1908.

ENTOMOLOGICAL NEWS

University
MAY
1908
Stanford

Vol. XIX. No. 5.

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON. HENRY L. VIERECK. J. A. G. REHN.
PHILIP LAURENT. WILLIAM J. FOX. H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September**, in charge of the E
logical Section of the Academy of Natural Sciences, Philadelphia,
and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.
Outside of the United States and Canada, $1.20.
SINGLE COPIES 15 CENTS

Advertising Rates: 50 cents per square inch, single insertion; a liberal disc
on longer insertions. No advertisement taken for less than
60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NEW
Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

A SPECIAL OFFER

Of Rare Lepidoptera for the Month of May Only. Specimens are in Papers; in perf
condition. Send 12 cents additional with each order to cover postage and packing

Actias maenas var. [illegible], male	[illegible]	*Troides* [illegible], [illegible]	
" *leto* (northern India), male	[illegible]	*Papilio blumei*	
" *selene*, male	[illegible]	" *androcles*	
" *gnoma* (Japan), male	[illegible]	" *buddha*, male	
Attacus atlas (Celebes Islands)	1.50	" [illegible], male	
Antheraea roylei, male	[illegible]	*Caligo eurylochus*	
" *frithi*, male	[illegible]	" *atreus*	
" *assamensis*, male	[illegible]	*Thaumantis diores*, male	
Brahmaea japonica	[illegible]	*Kallima albofasciata*, male	

50 Butterflies from Assam. A fine assortment containing several varieties of Delias, Cethosia, Charaxes, Amathusia, [illegible], Papilio paris, and many other desirable varieties. No duplicates. All correctly named. **$5**

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA.

ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in botany, especially cacti and herpetology—reptiles and amphibians if notified early in the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th St., New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSECT

(EXCEPT ODONATA)

OF THE UNITED STATES

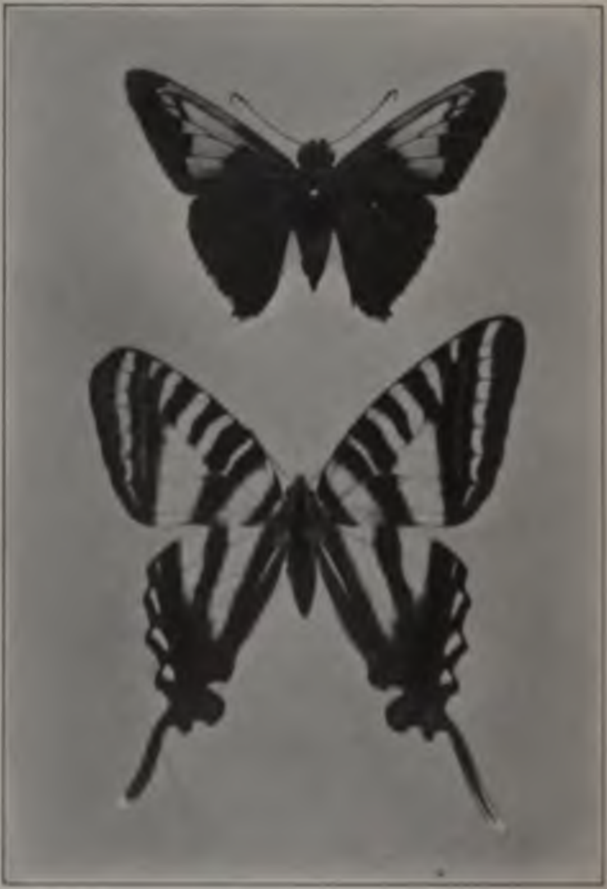
BY NATHAN BANKS

Complete to Summer of 1907   Price 50 cts. net per copy   Mailed on receipt of

☞ Send for copy of New Additions to ☜
Price List; just issued.

E. T. CRESSON, Treas., P. O. Box 248, Philadelphia, Pa

When Writing Please Mention "Entomological News."



EUDAMUS TITYRUS.
PAPILIO AJAX (BIFORMED).
(SMYTH)

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. MAY, 1908. No. 5.

CONTENTS:

Smith—Two Freaks: Papilio ajax and Eudamus tityrus.................... 191
Pearsall—Eastern Eupithecias......... 192
Swett—Packard's Eupithecias......... 196
Girault—Texas, Virginia and Maryland notes on the Catalpa Sphinx, Ceratomia catalpae Boisduval.......... 197
Doane—New Species of the Tipulid genus Rhypholophus, with a Table for Determining the North American species......................... 200
Banks—A new genus and species of Neuroptera......................... 203
Coolidge and Newcomer—The Life History of Euchloe ausonides Boisd... 204
Felt—Contarinia gossypii n. sp........ 210
Houghton—The Blackberry Leaf-Miner 212
Bowditch—Notes on Pachybrachys.... 216
Saverner—Migrating Butterflies....... 218
Rohwer—Some Larrid Wasps from Colorado.............................. 220
Wellman—Notes on some Angolan Insects of Economic or Pathologic Importance........................ 224
Jones—Callosamia angulifera Walk., n. var. carolina..................... 231
Tandy—The Carpenter Mud Wasp.... 231
Editorial 233
Notes and News 234
Doings of Societies.................... 236
Obituary—James H. Ridings........... 242
" —Prof. Willis Grant Johnson. 242

Two Freaks:—Papilio ajax and Eudamus tityrus.

BY ELLISON A. SMYTH, JR., Blacksburg, Va.

(Pl. X.)

There has always been a fascination for me in breeding from the egg *Papilio ajax*, and repeating in various combinations Edwards' classical experiment with this species. Doubtless everyone who has bred this fly has noted the varied length of pupation in individuals of the same brood, has had early spring eggs produce one form in a few weeks, others of the same brood bring forth another form in midsummer, still others disclose imagines of a third form in the late fall and some pass over one or even two winters and produce the different forms the second or even the third spring, summer or fall. In a large series bred from eggs laid in June, 1902, which gave *walshii*, *telamonides* and *marcellus* at appropriate periods, I had one pupa among others last over until April, 1903, when it disclosed a biformed female, the left side of which had only the small white spot at the end of the tail (shall I call it *ajax* *walshii?*), and the right half with the terminal caudal spot extended up the sides of the tail (*ajax telamonides*). The accompanying photograph is of this individual, now in my collection. It will be noticed that the apex of the left forewing is apparently not fully developed: the reason for this may also be the cause of the bi-formation.

The other figure is of a specimen of *Eudamus tityrus* with the yellow spots suffused over the apical area of the forewing. It was caught by me in a garden in Charleston, S. C., June 29, 1897, in company with a large series of normal specimens of the same species and its peculiarities were not noticed until it was afterwards expanded. On the under side of the hind wings the silver-white spot, large in the normal form, is reduced to a mere dash along the base of the cell, and an isolated faint mark at right angles to and touching sub-costal vein opposite base of cell.

◆

Eastern Eupithecias.

BY RICHARD F. PEARSALL.

Eupithecia catskillata n. sp.

Expanse 16-17 mm. Palpi long, rather heavy, dark brown, the tips white. Antennae silvery, annulate with pale brown, shortly ciliate in ♂. Vertex and front with dark brown and gray scales mixed.

Thorax with band of dark brown crossing it in front centrally by a narrow pure white band not always present; the scutellar region tipped with a conspicuous spot of white scales. Fore wings broad, well rounded, pale gray tinged with yellow brown. A dark area at base, crossed by a series of faint lines a little darker, is limited by a double pale line which leaves costa above discal spot, sweeps outward in a bold curve quite around and touching it, and in another broad outward curve reaches inner margin one half out. This line is broader and clearer than the extra discal pale line which is also present and angled outward below costa, runs parallel with it, rather nearer the margin than usual. Between them a dusky shade line, is marked with short dashes on veins. The subterminal white line very obscure and narrow, except at anal angle where it forms a broad lunule curved inward. Discal dots oval, distinct, black. Below discal dot, at end of cell is a small patch of yellow scales present in all of my examples. Subterminal space dark like basal area, frosted costally at apex with white. Marginal line usually entire, black. Fringes long pale gray with darker patches at end of veins, on all wings. Hind wings rounded, paler subcostally, otherwise the same arrangement of lines as on fore wings but without darker basal area, and much more obscure. Discal dot small, faint. Beneath grayish white. The double series of pale lines as above, very apparent, almost pure white, and the separating dusky lines diffuse. Basal line on hind wings rounded, entire, an intra discal runs outward to discal dot, though not always touching it, turns backward to inner margin at almost a right angle, and extra discal with outward curve around discal dot, reaches inner margin one-half out. A diffuse, dusky shade line, subterminally. Abdomen beneath and legs pale silvery gray.

Type ♂ and ♀ taken in Big Indian Valley, Catskill Mountains, the former May 25th, '06, the latter May 31, '06, in my collection.

Co-types 24 ♂ and ♀ taken in same locality May 25 to June 12. Readily determined by the patch of yellow scales on fore wings beneath discal dot on fore wings, and the snow white scutellar area. Near to *fletcherata Taylor,* but smaller.

Eupithecia erpata n. sp.

Expanse 17-18 mm. Palpi long dark brown, mixed gray scales. Vertex and front dark brownish ash. Thorax and abdomen above, dark wood brown with a few pale scales intermixed, the second segment entirely soiled white, the sixth and seventh, with black dots laterally; tufts, small, black, all wings somewhat extended, above dark ashen brown faintly tinged with yellowish, the latter more apparent on fore wings, at junction of veins three and four, and subterminally, especially toward apex. Over all is a thin sprinkling of black scales, heaviest along costa and subterminally. Basal area to discal line is crossed by wavy indefinite lines, of darker hue. The black discal line curves sharply outward at costa, then recedes toward base, touching inner margin, one-third out. It is faint and narrow, bordered by a pale gray line. The intradiscal, also faint, starts from costa, with an ill-defined cloud above discal dot, extends outward to include same, and thence straight to inner margin. In rubbed examples this line is frequently wanting, with the discal space paler and clear. The extra discal with its succeeding double pale lines, are sharp and distinct, the former black, more intense centrally, where also a few white scales border it outwardly. It curves gently outward around cell, without angle at costa, to inner margin, having sharp inward spurs on veins one and two. Subterminal space darker; the central clear white line runs in waves parallel to the double lines, and ends near anal angle in a larger angular white patch. Marginal line black nearly

entire. Fringes long dusky, cut sharply with dark brown at ends of veins.

Hind wings paler costally, the cross lines fading out except the discal and extra discal, both crossing the wing in regular curves, to inner margin, the latter and its succeeding pale lines, well marked. Subterminal space darker, narrow, traversed centrally, as in fore wings, with a clear white waved line. Fringes as on fore wings. Discal dots on all wings small black, wanting in some examples. Beneath, pale ash gray, the lines above distinctly reproduced, especially the extra discal, and a subterminal shade line which are black at costa on fore wings. Discal spots linear, black, very distinct. Hind wings with cross lines diffuse, the discal boldly angled outward at cell turns sharply backward to inner margin, intradiscal rounded to discal spot which it includes, thence parallel with discal line to margin, extra discal starting from costa with strong outward curve encircles discal spot thence straight to inner margin, and subterminal, parallel with margin these latter as in fore wings most distinct; discal dots round, black, prominent. Body beneath and legs pale ashen.

Type ♂ and ♀ taken in Big Indian Valley, Catskill Mountains, the former, May 5, '07, the latter April 29, '07, together with 18 co-types in both sexes in my collection.

I have received this species from Mr. F. A. Merrick, New Brighton, Pennsylvania and from Massachusetts. It resembles *palpata* but is smaller. From that species it differs in having the pale line near base of abdomen and its tip beneath not dark. Its striking features are prominence of the extra discal and pale lines above on all wings, and by the short inner margin of hind wings which causes the lines to run from it almost laterally for half their length, the anal angle being nearly obliterated.

After a long period of obscurity *Eup. coagulata* Guen. has been separated from *geminata* Pack., but there still remain under the latter name two distinct species, not difficult of separation with good series of specimens. To which belong the name of *geminata*? In Dr. Packard's original description (5th Report Peab. Acady., page 58) he notes, one special feature—*the large discal dots on all wings*—which serves to fix the application of his name to the larger species—with its expanse of 25 mm. and over. The smaller species I describe herewith, having before me a series of eleven in both sexes, under the name of

Eupithecia meritata n. sp.

Expanse 20-22 mm. Head, thorax, body, except second segment of abdomen, which is black, and wings above, a uniform dark cinerous, crossed by fine black lines, or rows of dots on veins. These lines enlarged at costa, the two largest just preceding and beyond the discal dot. The basal line at costa bends sharply outward, then retreats toward base at inner margin. The discal line, with a short outward angle at costa, runs straight across wing. Extra discal is a series of dots on veins, rounded out from costa to below cell, thence direct to inner margin. Midway between these a fine black distinct line starts from costa, rounds out sharply to enclose discal dot, below which it runs straight to inner margin, sometimes wavy. Subterminal clear space, beyond the narrow pale line following extra discal, and parallel to it, is traversed centrally by a fine whitish crenulate line, a little clearer at anal angle. Centrally the veins are marked quite freely with black dashes. Fringes long, cinerous, darkened at ends of veins. Fine terminal line black. Abdomen, with scattering brownish scales, tufts small, black; below somewhat darker. Body and legs pale cinerous. Comparison with *geminata Pack.* might be useful and descriptive. It may be separated thus: Beside its smaller size which is quite constant, the upper surface is darker, more distinctly marked with black fine lines, or sharply dotted. The white line in submarginal space is clear and continuous, and the discal dots large oval, jet black on forewings, are entirely wanting on hindwings, or very faint and small; while in *geminata*, the discal dots on *all* wings are large and very prominent. Beneath, the surface is crossed by well-defined bands, a little diffuse in some examples, the extra discal on both wings and the pale line beyond it particularly clear. The white submarginal line reappears below quite plainly and the discal dots if present are fainter—while in *geminata* the under surface is clear silvery cinerous, the pale line beyond extra discal only showing by contrast with dusky shade preceding and subterminally, the latter not traversed by white line, and the discal dots large, distinct on all wings.

Type, ♂ and ♀ from Big Indian Valley, Catskill Mountains, July 6 and 16, 1899, in my collection. Co-types from Mr. F. A. Merrick, New Brighton, Pa., taken in August, 1907, represented in the Merrick Museum, and in my collection.

NOTE—In March issue Ent. News, the date of capture of ♀ type of *Eup. conformata* should read April 23, 1904, and of the types of *filmata* April 29, 1907.

Packard's Eupithecias.

By L. W. Swett.

Eupithecia palpata.

This species has been discussed by Rev. G. W. Taylor and Mr. J. Grossbeck in the Entomological News and Canadian Entomologist. About two years ago my esteemed friend, Dr. Russel of Winchendon, Mass., sent me about twenty-five of this species and I took them to Cambridge to compare with the type of *Eupithecia luteata* under which name Packard listed it as a synonym. The type of *luteata* was there with the correct label, a male in poor condition, also *palpata* ♂ Brunswick, Maine, but no other type specimens. I found that *palpata* had longer palpi than *luteata* but was rubbed so that I didn't want to be positive. I communicated with Dr. Taylor and Mr. Grossbeck and told them what I found. Shortly afterwards I received a specimen of *palpata* labelled *ornata* Hulst. from Dr. Taylor with the locality Penn., but agreeing with my specimens except that the fringe was slightly darker. A little while after, I received a second letter from Dr. Taylor saying that he agreed with me as to *palpata* and that Hulst had identified incorrectly that species as his *ornata* which was not like the true *ornata* Hulst. So matters began to clear and Dr. Taylor and Mr. Grossbeck were entirely correct in their articles, though I am afraid I influenced them somewhat by being unwilling to separate the two at first, even though it was I who first noted the structural differences. On my last trip to Albany I found the remaining types of *Eupithecia palpata* male and female agreeing with the Maine type at Cambridge but much larger. The Albany types bear the label *Eupithecia palpata* and below *E. luteata*, showing that Packard was uncertain of his species. Now being sure that I had *palpata* correct as I knew all the types I went to Cambridge and made minute comparisons. *Eup. luteata* is badly rubbed but can be separated from *palpata* as follows: palpi of *luteata* short, scarcely beyond head, extra discal line angulated below costa the median portion is rubbed but I believe a line must have run through discal spot once, for on the inner margin directly beneath discal mark is a prominent black dash. *Eup. palpata* has long palpi, extra discal line always rounded below costa never angulated in the series of 60 specimens which I have compared and lacks the black line on inner margin and is only two-thirds as large as *luteata*. Now that we know all the types which we did not before and found *luteata* labels in Packard's handwriting on *palpata* types at Albany, I think we have good grounds for knowing that Packard confused the two species and that they should be listed as separate species. This in no way effects the previous excellent articles by Mr. Grossbeck and Dr. Taylor but confirms their statements and settles the standing of *palpata* by finding the missing types at Albany. It is strange the older authors did not know this species as it seems to be very common, extending from northern Maine to Pennsylvania and is not variable.

◆

Texas, Virginia and Maryland notes on the Catalpa Sphinx, Ceratomia catalpae Boisduval.

By A. Arsene Girault.

The caterpillars of this species were very abundant and injurious in 1904 to catalpa trees (*Catalpa* species) lining some of the streets of the city of Paris, Texas. On certain streets they became so abundant as to be very annoying to pedestrians. During the season of 1904, I made tentative observations on the insect and these form more or less of an outline of the seasonal history of the species for that locality. Some additional notes are also submitted from southwest Virginia, and Annapolis, Maryland.

At Paris, Texas, on the 28th of June, 1904, it was noted that injury to the catalpa trees was noticeable and that the frass from the caterpillars made a noise like dropping rain. On the 13th of August, the caterpillars were so numerous on a row of catalpa trees on one side of east Lamar Avenue, that their frass covered the sidewalks beneath the infested trees for several blocks, and the continual dropping of it sounded very much like rain pattering on dead leaves in a forest; at this time, the pattering noise was much more noticeable than in late June. Besides, many of the large caterpillars, and those that were parasitized, were wandering over the pavements or crawling on fences and so forth, and by their presence added more or less to the general annoyance. On that date many of the trees were completely stripped of foliage, while others bore large bare patches, entirely destroying their appearance.

On September 23, 1904, the following note was made concerning this insect: "Nearly every catalpa tree in this vicinity was defoliated at some period during the present summer by these larvae; especially those on Lamar Avenue where the sidewalk was coated with pellets of frass for several months (August, September). Some of these trees put on as many as three sets of leaves during the season, while nearly all were stripped once and put out a second set. If this was repeated every season, the drain on the vitality of the trees would soon kill them."

According to notes the insect first made its appearance late in April. On May 7th, it was recorded that the larvae of the first generation were in instars II and III, and that these were pupating about May 21. The larvae of the second generation were present in different instars on June 20th. On July 1st, eggs were found, and larvae were pupating in numbers on July 3d, so that the generations soon afterwards became considerably mixed, and the notes failed to record anything more definite than that the third generation of caterpillars was present in July. The moths were then common. Another lapse then occurs in the notes, but on September 23d, it was recorded that a fourth generation of larvae was present many of which were nearly full grown. I am uncertain whether this was a fourth or fifth generation. It was noted that at that time the generation was much decreased in numbers, not as large, for instance, as the third generation. These notes indicate at least four generations of the species in northeastern Texas. The duration of the pupal instar in July was from about 10 to 12 days.

The caterpillars were much attacked by tachina flies, but none of the flies were reared. On August 17th, 211 specimens of the braconid parasite *Apanteles congregatus* Say (Detr. J. C. Crawford) were reared from a nearly full grown larva found several days previously, bearing the usual white cocoons on its body. No hyperparasites were present in this case.

At Blacksburg, Virginia an egg-mass of this species was collected on May 26, 1902 on the under surface of a leaf. These hatched on the morning of June 4th, or 9 days later. The top layer of eggs hatched first, and the egg-shells were not eaten by the larvae. The vacated egg-shells were of a dull heliotrope color. On June 7th at 3 P. M., some of the caterpillars began to pass through the first ecdysis, and this was completed on the 8th. On June 11th the second ecdysis occurred, and on the 14th the third. Unfortunately on the 16th, all of the larvae died from the effects of eating poisoned leaves accidentally given to them. A single cocoon of an ichneumon parasite was found attached along the petiole of one of the leaves introduced into the cage for food. This was found on June 20th, and was elliptical, oval, gray, with two interrupted dark bands, one near each end, irregular spots of the same color on each end, and about a quarter of an inch long; it was apparently the cocoon of a species of *Amorphota* Förster, or an allied genus in the Campoplegini. Near this cocoon the withered remains of a *catalpae* larva was found; a large hole was present on one side of the thorax near the head. These facts are mentioned because I believe there are no recorded primary parasites of the catalpa sphinx in the family Ichneumonidae.

A year previously, on July 8th, 1901, I twice observed a heteropteron sucking the juices from the body of young caterpillars, but have no note indicating what species it was.

At Annapolis, Maryland, the larvae were noticeably abundant July 29th, 1899, and present in various instars as late as October 10th, the same year. On June 30th, 1900 in the same locality in regard to a group of catalpa trees on the suburbs of the city, it was noted that some of them were completely stripped of their foliage, presenting a very desolate appearance. The caterpillars were also present in numbers near Annapolis in the month of September, 1901 and 1902.

New species of the Tipulid genus Rhypholophus, with a Table for Determining the North American species.

R. W. Doane, Stanford University.

1. Discal cell closed, or coalescing with the second posterior cell . . 2
   Discal cell open, coalescing with the third posterior cell . . 11.
2. Wings variegated with gray or brown markings. . . . . . 3.
   Wings uniformly colored . . . . 5.
3. Sixth and seventh longitudinal veins divergent, wings spotted with brown in all the cells . . . . **innocens** O. S.
   Sixth and seventh longitudinal veins parallel or converging toward the tip . . . . 4.
4. A narrow, indefinite, sometimes almost obsolete brown band running from the stigma across the central cross-veins. **fascipennis** Zett.
   Three more or less definite brownish or grayish bands across the apical portion and three spots in the basal portion of the wing. **nubilus** O. S.
5. Seventh vein arcuated in such a way that the axillary cell is as wide or wider in the middle than at the tip 6
   Sixth and seventh veins divergent at the tip 8
6. Discal cell open, coalescing with the second posterior cell. **holotrichus** O. S.
   Discal cell closed. 7
7. Antennæ altogether brownish . . . . **arcuatus** n. sp.
   First and second segments of the antennæ yellow . **fumatus** Doane
8. Antennæ altogether brownish . . . . **diversus** n. sp.
   Antennæ yellow at the base . . . . 9.
9. Discal cell open, coalescing with the second posterior cell. **flaveolus** Coq.
   Discal cell closed . . . . 10.
10. First four segments of antennæ yellow . . **nigripilis** O. S.
    First two segments of antennæ yellow . **fusiformis** Doane
11. Thorax reddish, with a distinct black line in the middle. **rubellus** O. S.
    Thorax brownish or yellowish 12
12. Wings with a conspicuous stigmatal spot . 13.
    Stigmatal spot not conspicuous . . 15.
13. First two segments of antennæ yellowish **lanuginosus** Doane
    Antennæ wholly brownish 14
14. Claw at the tip of the lobes of the hypopygium simple, with a single straight branch at the base . . **meigenii** O. S.
    Claw at the tip of the lobes of the hypopygium complex, base very broad and emitting three short curved branches . **cornutus** n. s.

15. Thorax light yellow . . . . 16.
Thorax brownish or brownish-yellow . . . . 17.
16. Antennæ and palpi, except basal joint, brown . . . . **cockerelli** Coq.
Antennæ wholly yellow . . . . **parallelus** n. sp.
17. Antennæ of male long, reaching beyond the root of the wings . . 18.
Antenna of male not reaching beyond root of wings. .**manicatus** Doane.
18. Antennæ of male longer than the whole body . . . **longicornus** n. sp.
Antennæ not longer than the whole body . . . . 19.
19. Thorax with three brown stripes . . . . **affinis** Lund.
Thorax without stripes . . . . **monticola** O. S.

Rhypholophus arcuatus n. sp.

Brown; head grayish brown, front darker; rostrum, palpi and antennae brown, the latter somewhat lighter toward the base; thorax brown with a grayish bloom, with rather long yellow hairs; scutellum and metanotum hoary; halteres pale, knobs slightly darker; legs light brown, tarsi darker; abdomen brown with rather dense light yellow hair; ovipositor long, ferrugineous, upper valves strongly arcuated; wings brown, pubescence rather dense of medium length; stigma slightly darker; veins darker brown; auxiliary cross vein about half way between the origin of the praefurca and the tip of the auxiliary vein; discal cell closed, seventh vein arcuated in such a way that the axillary cell is broader in the middle than at the tip. Length 6 mm., wing 8 mm.

Hab.—Ithaca, N. Y. Two females.

Rhypholophus divexus n. sp.

Brown; palpi and first joint of antennae dark brown, other segments of antennae very light brown; thorax wholly light yellowish-brown; legs brown; femora, except at the base, much darker; abdomen brown; with dense rather long brownish-yellow hairs; ovipositor ferrugineous, upper valves strongly arcuated; wings brown; stigma darker brown, distinct; pubescence rather long and dense; discal cell opening into the second posterior cell; sixth and seventh veins diverging. Length 4 mm., wing 6 mm.

Hab.—Keyport, Wash. One female.

Rhypholophus longicornus n. sp.

Brown; palpi and antennae brown, elongate the latter in the male as long as the whole body; joints of the flagellum somewhat fusiform with a dense whirl of long fine light-brown hairs; thorax brownish yellow, slightly darker above; halteres yellowish brown, tips of knobs darker brown; legs light brown; abdomen brown with rather dense long light-yellowish hairs; hypopygium yellow, lobes somewhat elongate, claws reddish-brown darker at the tips; ovipositor ferrugineous, long, slender, upper valves conspicuously arcuated; wings rather broad, brown, stigma and the costal cell somewhat darker; pubescence long and dense over the whole wing; discal cell opening into the third posterior cell; distal portion of the sixth and seventh veins subparallel Length 4 mm., wing 6 mm.

Hab.—Keyport, Wash. Two males, two females.

Rhypholophus parallelus n. sp.

Yellow; front and palpi somewhat darker; antennae wholly yellow; thorax reddish yellow, slightly darker above; halteres pale yellow; knobs slightly infuscated at the tip; legs yellowish; abdomen brownish above, yellow below; ovipositor reddish-yellow, upper valves somewhat arcuated; wings brown, rather narrow; stigma indistinct; discal cell opening into the third posterior cell; distal portion of the sixth and seventh veins subparallel, the latter slightly arcuated; pubescence on the wings rather long and dense. Length 5 mm., wing 6 mm

Hab.—Ithaca, N. Y. Two females.

Rhypholophus cornutus n. sp.

Yellowish-brown; rostrum and palpi darker brown; antennae light brown, joints of the flagellum of the male with a dense soft pubescence and long verticles, those of the female with the pubescence less dense. thorax yellowish-brown with sparse reddish-yellow hairs; halteres yellowish; legs brownish, femora lighter toward the base; abdomen brown, with long sparse yellow hairs; hypopygium reddish-brown, horny appendages black, those at the tip of the lobes very broad and emitting three short curved branches; ovipositor reddish-yellow, upper valves slightly arcuated; wings brown; stigma darker brown; pubescence on wings not very long or dense; discal cell opening into the third posterior cell; distal portions of the sixth and seventh veins subparallel Length 5 mm., wing 6 mm.

Hab.—Stanford University, Cal. Two males, one female

◆

EVELYN GROESBEECK MITCHELL has brought suit against Dr Harrison G Dyar to recover $35,000 damages on account of a review of her book on mosquitoes which he published in the Canadian Entomologist

NOTE ON *Perilitus americanus* RILEY.—At Paris, Texas, adults of *Megilla maculata* DeGeer were quite commonly found during the second week in July, 1904, and later, adhering to the cocoons of this species, its parasite, in corn fields. Many of these cocoons were brought into the laboratory and the resulting parasites proved to be all females, which varied considerably in size. The cocoons of the parasite were still numerous in August at Paris and were also found at Will's Point, Texas, on August 15th. The pupal instar was recorded in two cases, beginning with the formation of the cocoon: July 16-22, 5½ days, and July 18-23, 5 days.—A. A. GIRAULT, Paris, Texas.

A new genus and species of Neuroptera.

By NATHAN BANKS.

Recently Dr. J. B. Smith in sending some New Jersey material, included a few forms from California. Among the latter is a specimen of a Hemerobiid belonging to a new genus and species. As I have lately revised our species of this family it is with much interest that I add this striking form to our fauna.

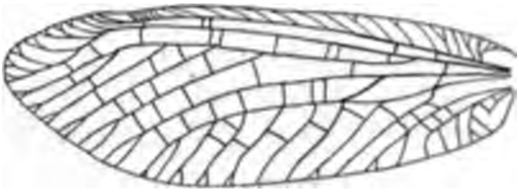
OLIARCES n. gen.

Body thick and heavy as in *Polystoechotes,* head rather small, no ocelli; antennae broken, scarcely the diameter of basal segment apart, and closer to the small eyes; pronotum about three times as broad as long, a little broader behind than in front, abdomen rather short and stout. Legs slender, tibial spurs distinct, no spines, but many hairs and bristles, apical tarsal joint as long as basal, others much shorter. Wings moderately slender; in the fore wings the radius and sub-costa do not unite near tip, although they come very close together; beyond the stigmal region the radius is bent downward and emits several forked branches from its upper side to the margin of wing; the lower branch of the median vein, soon after its origin, unites with the cubital; the latter gives off a number of branches to the margin; cross-veins quite numerous, but not in series; at costal base is a recurrent vein; the radial sector arises near base of wing, but has only four branches; the costal cross-veins are outwardly oblique. The hind wings are veined much like the fore pair, but the lower branch of the medius does not run into the cubital vein, but parallel to it, and soon forks; cross-veins hardly as numerous as in the fore pair; and radial sector with five branches.

In many respects this is similar to *Polystoechotes,* but differs at once by the subcosta not joining the radius, by the much fewer branches of the radial sector, irregular cross-veins, and in forewings by the union of lower branch of median vein to the cubital.

Oliarces clara n. sp.

Head and body dark brown, mouth and antennae paler; pronotum clothed with long dark hair; legs dull yellowish, very hairy; abdomen pale brown beneath, darker above, very hairy, the apical joints beneath are flattened, and the last has a broad basal concave scar, this last segment in the male (at least), is about twice as broad as long, with nearly parallel sides, and at each side shortly before tip is a very large, stout appendage, with a broadly rounded, incurved tip, all very hairy. Wings hyaline, venation whitish, the radius at extreme base is fuscous. Expanse 35 mm.



Forewing *Oliarces clara* Banks.

One specimen from Walter's Station, Calif., April; kindly sent me by Prof. J. B. Smith.

The Life History of Euchloe ausonides Boisd.

KARL R. COOLIDGE AND EWAL J. NEWCOMER.

Euchloe ausonides was first described by Boisduval in 1852, in the Annales de la Société Entomologique de France. Since then it has been described and figured by Edwards, Mead, Holland, Wright, and others. It is closely allied to the European *ausonia*, and we believe the two forms will prove identical. Beutenmüller writes[*], "The European species is double brooded, and as far as I can learn the larva is also different from our species." As with other North American forms of *Euchloe*, *ausonides* has usually been considered monogoneutic,[†] but in several cases which we observed last year, imagines have emerged in the early summer instead of hibernating in the chrysalis, thus indicating the representatives of a second brood

Edwards[‡] says of *ausonides*: "*Ausonides*, as remarked by

---

[*] Bull Am. Mus. Nat. Hist. p. 240, 1898.

[†] W. H Edwards (Can. Ent., XXIV, 109) writes: "I am told that some collectors think that *A. hyantis* is the spring form of *ausonides* If so, it is a mistake. There is but one annual brood of *ausonides* In different years I have had four examples come from bred pupae; all in the month of March; all typical *ausonides*."

[‡] Butt. N. Am. V. 2, 1874.

Dr. Boisduval, is scarcely distinguishable from *ausonia* Hbn., a species found in the regions bordering the Mediterranean, and subject to much variation, especially in the degree of mottling of the underside of the secondaries.

The alpine variety *simplonia* Freyer, seems nearest the usual American type, though we have also individuals in which the markings approach *belia* Esper., considered to be another variety of *ausonia*.

A comparison of the larvae and the chrysalids would best determine the relationship, but I have been unable to find a description of these stages of *ausonia*. It is to be noticed that where a species becomes widely dispersed and sections are separated by impassable barriers, the larvae are often first to differ, and may become quite distinct before any wide difference is observed in the imago."

As in all our species of *Euchloe*, *ausonides* exhibits considerable variation especially in size and the density of coloration. In the male the ground color is sometimes pure white, but may be more or less yellow-tinted. The female frequently has the upper surface of the secondaries suffused with a buff or ochraceous tint and the dark green marbling of the inferior surface of the secondaries varies somewhat in density in both sexes. The discal spot also varies considerably; sometimes it is reniform, or lunate, or in the form of a sinuous bar, of variable breadth. As a rule, western specimens are much larger than eastern. We do not consider the variety *hyantis* Hy. Edw., as placed by Dyar and Skinner, a variety of *ausonides*. It is not the summer brood as we have compared our specimens with descriptions of *hyantis* and find them abundantly distinct. Specimens of the summer brood closely resemble those of the typical form, except in being more yellow-tinted. The form *coloradensis* Hy. Edw., may be known by its deeper green tint on the underside of the secondaries, and the discal bar of the primaries above is in the form of a small, black, lunate dash. It is recorded from Montana, Colorado and California. We have not noticed it in this locality. As shown by good series, it intervaries to *ausonides* and can hardly be considered worthy of varietal rank. It would be interesting to compare our varieties of *ausonides* with those of *ausonia*. Although *ausonides* has a wide distribution, ranging west of the Rocky Mountains from Arizona to Alaska, it appears to be rather local, but is quite common when found. In the Santa Clara Valley, it is a common and early butterfly, flying about the flowers of *Brassica*, *Radix* and other cruciferous plants. It usually appears about the end of February, sometimes earlier and is on the wing until June and the earlier part of July. This varies, of course, according to the locality. In Colorado it appears in May and June, and in Montana we have taken newly emerged specimens as late as July. In the high Sierras it flies until the end of July.

The flight of *ausonides* is much similar to that of congeneric species. It flies but a few feet above the ground, in a somewhat zigzag, aimless course, alighting only on flowers. It was probably for this reason that the name *Anthocharis** was given to the genus by Boisduval. When alarmed, however, its erratic flight makes capture difficult. Little has ever been written of the preparatory stages of *ausonides*. Mead found the eggs and larvæ in Colorado and Edwards† has figured the egg, larva and pupa and described the mature larva and pupa. Beutenmüller has briefly compiled a description of the larva and chrysalis and Hy. Edwards, in the Proc. Cal. Acad. Science, v. 5, p. 326, describes the larva from Mead in litt.

In a letter to W. H. Edwards, Mead writes: "At Turkey Creek Junction there were many eggs and some larvae to be found, the latter feeding on the flowers and seed vessels of a cruciferous plant. The eggs were long, ribbed longitudinally, and in color light yellow. The larvae are solitary, and are seen stretched at length on the stem or seed-pods of the plant." The transitional stages of the larva have never been described. At first, we had some difficulty in finding the eggs but a little experience made it easy. The egg-laying habits are much similar to those of allied species and agree well with *olympia*, the life-history of which was recently described by Shull‡. Our first record of oviposition is March 14, but this is perhaps a little earlier than usually occurs. The eggs are mostly placed on the *sepals* of the young inner buds of the plant and also quite commonly on various parts of the *pedicel*, especially on the *rachis*. In a few cases we have observed the female ovipositing on the leaves. The illustration shows the normal position. We have never seen a female lay more than one egg in a flower cluster, although occasionally she will deposit several on the same plant. However, as many as six or seven have been found in a single cluster, but these must have been laid by different females or by the same female at different times. We concur with Prof. Shull in saying that the egg-shell is not eaten. He says, "my observations on this point are at variance with the statement commonly made that butterfly larvae devour the shell from which they emerge before beginning to feed upon the food plant."

---

* **Ανθος** (anthos), a flower, and **Χαίρειν** (chairein), to delight in.

†Butt N. Am. Vol. II, pl. 2.

‡Ent. News, Vol. XVIII, 1907.

There are a large number of species, the young larvae of which do not eat the egg shell. In the case of *Pyrgus tessellata,* eggs of which we have found abundantly on *Malva borealis,* a small circular hole was the only evidence that the larva had escaped, the empty shell remaining firm and intact.

The young larvae of *ausonides* escape by eating away a portion of one side of the egg shell. Their first vegetable food consists of the young and tender sepals and petals or very rarely the leaves of their food plant. As they mature and after the flowers have disappeared they feed on the seed pods. In captivity, the mature larvae are inclined to be larvaphagous and will readily devour each other when opportunity offers. There is a striking resemblance between the larva of *ausonides* and that of several species of *Pontia,* particularly *protodice,* "more alike," writes Edwards, "in color, form, and markings than often happens between species of the same genus." There is no pupal resemblance whatsoever. As a rule, the duration of the instars we have found to be fairly regular but may vary considerably according to the condition of the weather.

The following is a record of ten cases which we observed.

TIME IN DAYS

	1st Instar	2nd	3rd	4th	To Girdle	To Pupa
1	8	4	3	4	6	2
2	6	3	3	3	6	2
3	7	3	3	5	6	$1\frac{1}{2}$
4	5	3	3	4	4	$1\frac{1}{2}$
5	5	3	3	4	7	$1\frac{1}{2}$
6	6	4	3			
7	9	5	12			
8	5	3	3	3	8	$1\frac{1}{2}$
9	6	2	5	2		
10	6	4	9			
Av.	$6\frac{3}{10}$	$3\frac{2}{5}$	$4\frac{7}{10}$	$3\frac{4}{7}$	$6\frac{1}{6}$	$1\frac{2}{3}$

We wish here to thank Prof. Chas. A. Shull for his kindness in copying for us the anthocharid text from Edward's work and Miss Julia Wright for her excellent illustrations.

Egg. Fusiform, laterally marked with about sixteen raised vertical ridges, between which are finer cross veins, nearly 1 mm in length. Color when first laid light bluish green changing in 24 to 30 hours to light orange. By the third day the color is almost vermilion and about the sixth the egg turns dirty yellow brown, especially so apically. The duration of the egg stage is about seven days, varying according to the season.

First Instar.—Length, a little over 1 mm. Color, orange-yellow, becoming lighter in a day or two; head almost black; body sparsely covered with dark colored hairs.

Second Instar.—Length about 4 mm. Color, light greenish, soon turning dark; head black.

Third Instar.—Length, 5.5 mm. The markings can now be plainly seen; the dorsal stripe is bluish or grayish green; on each side of this is a subdorsal yellowish green stripe, then a lateral grayish green stripe, and finally an infralateral yellowish line; ventral surface greenish; head greenish almost black; numerous black tubercles scattered over the body.

Fourth Instar.—Length, 17 mm.; maculations more sharply defined than before; head rather light greenish-gray sprinkled over with black tubercles from which protrude short bristles.

Fifth Instar.—Length in motion 33 mm.; at rest 28 mm. Cylindrical, slender; head rounded, small. Colors much brighter; ground color dark green; upper half of infralateral line white, lower half yellow; head green speckled with black; thoracic legs black, abdominal ones greenish-yellow.

The larva, when full grown, loses its bright colors and soon spins the silken buttons and girdle from which it is to hang, The former colors are replaced anteriorly and on the line of the spiracles by a purplish tinge. After the girdle is completed, the larva remains quiet for from 36 to 40 hours, when pupation takes place. It will not be necessary to give at length this operation, as it has already been described in the case of a closely allied species (*olympia*) and is also much similar to that of *Pontia rapae* and others of that genus.

Chrysalis.—Average length 26 mm. Cylindrical, slender, thickest in middle and tapering therefrom evenly, the ends being nearly equal size. At first the chrysalis has the same general purplish tinge of the larva and the dorsal side shows the same markings. The wing-cases and projection of head are almost transparent. These, especially the latter, soon turn dark. Final color, anterior portion dark brown, continuing on the ventral side to the tips of the antennæ, which are light, and on the dorsal side only to a point opposite the eyes; wing veins marked in brown; dorsal side of thorax and abdomen light yellow or cream color; ventral side light brown. There are five well-defined lines on the pupa; a dorsal one, dark brown, running the full length of the body except for the last two posterior segments; two laterals, also dark brown, running the full length of the abdomen and shaded into the other markings of the thorax; two lying about midway between the lateral and ventral lines, light brown and continuing only to the wing-cases. The ventral line is very slightly marked.

Considerable variation is shown in the color of the markings and also in the degree of re-curvature of the palpi-cases.

Contarinia gossypii n. sp.

By E. P. Felt, Albany, N. Y.

This species is injurious to cotton in the British West Indies, and was received from Mr. Henry A. Ballou, Entomologist to the Imperial Department of Agriculture, Barbadoes, through Dr. L. O. Howard, at whose request it is described:

Male.—Length 1 mm. Antennae about twice the length of the body, thickly haired, light brown, 14 segments; the first broadly obconic, the second flattened basally, subhemispheric; the others binodose, the third and fourth slightly fused, the fifth having the basal portion of the stem with a length three times its diameter, the distal part with a length four times its diameter; the enlargements with the membrane thickly dotted with chitinous points; the basal one subglobose, flattened basally, with a sub-basal whorl of long, stout setae and a subapical circumfilum; the loops of the latter long and extending to the middle of the distal enlargement, which latter is slightly produced, broadly oval, with a thick whorl of long, stout, curved setae near the middle and a subapical circumfilum, the loops of the latter distinct and extending to the middle of the basal enlargement of the following segment, terminal segment with the basal enlargement subglobose the basal portion of the stem somewhat produced, slender; the distal enlargement slightly produced and bearing apically a long slender finger like process. Palpi quadriarticulate, the first segment apparently short, stout, irregularly subquadrate; the second a little longer, broadly ovate; the third fully half longer than the second, more slender; the fourth as long as the third, more slender, all rather thickly clothed with coarse setae. Face fuscous, yellowish, eyes large black, mesonotum dark brown, the submedian lines yellowish scutellum fuscous yellowish; postscutellum yellowish; abdomen greenish yellowish, the segments posteriorly rather thickly margined with coarse setae, wings hyaline, costa pale straw, subcosta uniting with the anterior margin near the basal third, the third vein just beyond the apex, the fifth joining the posterior margin at the distal fourth, its branch near the basal third; membrane sparsely clothed with fine hairs. Halteres presumably yellowish transparent, coxae yellowish, femora and tibiae pale yellowish straw, tarsi slightly darker. Claws long, slender, evenly curved, simple, the pulvilli a little shorter than the claws. Genitalia; basal clasp segment rather long, broad, tapering to a narrowly rounded apex; terminal clasp segment long and tapering slightly to an obtusely rounded apex. Dorsal plate and other minor organs indistinct in the preparation.

Female.—Length 1.5 mm. Antennae about as long as the body, sparsely haired, pale yellowish, 14 segments; the first broadly obconic, the second somewhat produced, broadly fusiform, the others cylindric, the third and fourth slightly fused; the fifth with a stem about 1-5 the length of the subcylindric basal enlargement, which latter has a length nearly 2½ times its diameter, the membrane thickly dotted with chitinous points, with a thick sub-basal whorl of long, stout, curved setae, and a scattering subapical band of shorter curved setae; low circumfili occur near the basal third and apically; terminal segment strongly produced, the distal enlargement with a length about four times its diameter and distally tapering to a narrowly rounded apex. Palpi quadriarticulate; the first segment irregularly fusiform; the second narrowly oval and half longer than the first; the third half longer than the second, more slender; all rather thickly clothed with coarse setae. Colorational characters about as in the opposite sex, except that the abdomen appears to be a fuscous greenish yellow and the posterior margins of the segments, especially the apical ones, are more thickly clothed with coarse setae; tarsal characters as in the opposite sex. Ovipositor yellowish, probably nearly as long as the body when extended, the terminal lobes very long, slender, having a length fully five times the width and tapering to a subacute apex bearing a few short, stout setae subapically.

Described from a number of specimens recently mounted in balsam.

Types, C. 1331, deposited in the U. S. National Museum and New York State Museum.

* * *

PHENACOCCUS GOSSYPII.—Some time ago Prof. C. F. Baker sent me this species on *Jacobinia coccinea*, from Santiago de las Vegas, Cuba. Both locality and food-plant are new.—T. D. A. COCKERELL.

MR. HERMANN ROLLE, of Berlin, Germany, has published a number of lists and price catalogues of Lepidoptera and Coleoptera. These will be found useful to both the collector and the systematic worker.

The Blackberry Leaf-Miner.

(Scolioneura capitalis Norton.)

By C. O. Houghton, Newark, Del. Entomologist, Delaware Experiment Station.

About the middle of June, 1905, my attention was called to an injury, said to be quite serious, to dewberries on a farm near Dover, Delaware. My first visit to the place was on June 16th, at which time I found a field of about four acres considerably injured by a leaf-miner. Upon some of the plants dozens of leaves showed large, brownish blotches, and not a few of them contained two or three mines; the majority of the leaves, however, had but one. The patch was upon comparatively new ground, but was at some distance from woods. Other berry fields at some distance from this one (three or four miles) were said to be attacked in the same manner, but I did not see any of these. The owner of the field in question stated that this was the first occurrence of the pest in his fields.

Several of the leaves containing mines were collected and brought home for study. An examination of the larvae showed that they were apparently saw-fly larvae, but at that time I was unable to place them satisfactorily. An attempt was made to rear them by placing the leaves in jars containing earth, but apparently all of the larvae died without entering the earth at least several which emerged from their mines were later found dead on top of the earth in the jars.

On June 28th, 1905, I again visited the infested field, but found only a very few leaves upon the plants which contained larvae. Evidently they had practically all pupated at that date An attempt was made to locate some of the pupae in the ground near the bases of some of the infested plants, but without result

On July 11th I left Newark for a month's vacation, and upon my return early in August learned that a second brood of the leaf miner had appeared and that this brood had occasioned more injury than the first. A letter from the owner of the field, dated July 31st, stated that the miners were very abundant at that time, and occasioning considerable injury.

In 1906 my first visit to the field in question was made on May 30th, and at that time I found a few leaves with small mines in them. Some of the larvae taken from these mines measured 2 mm. in length. Considerable time was spent in the field, and I observed a number of small blackish-colored saw-flies flying about the plants and alighting upon the leaves. Some were evidently ovipositing, and the operation was observed. The insect would alight upon the upper surface of the leaf and select a spot for the deposition of the egg, apparently at random. Sometimes the place would be in the shade, sometimes in the sunshine, but so far as I could determine it was always upon the upper surface of the leaf. The tip of the abdomen would then be brought in contact with the leaf, and in a very short time, usually 30 to 50 seconds, the operation would be finished and the insect would fly away.

Some of the spots where eggs had apparently been deposited were marked, in the hope that later, with the aid of a microscope, I would be able to locate the eggs; but in this I failed. Several of the saw-flys were collected at this time, and one that was submitted to Dr. A. D. MacGillivray, was pronounced by him to be *Scolioneura capitalis* Norton.

This species was described by Norton in 1867,* as *Selandria (Blennocampa) capitalis,* from a single female taken at Brooklyn, N. Y. In 1895 Marlett re-described the species,† using Norton's type, and referred it to the genus *Scolioneura.* At the same time he described a new species of *Scolioneura, canadensis,* which, according to Dr. MacGillivray, is probably a form of *capitalis.* In 1884 Forbes bred from larvae found on mining leaves of cultivated blackberries at Normal, Ill., two specimens of the small saw-fly which were, according to Dr. MacGillivray, undoubtedly males of *S. capitalis,* but which Forbes described‡ as *Metallus rubi* (gen, et sp. nov.).** His description of the larva follows:

---

* Trans. Amer. Ent. Soc., Vol. I, p. 247.

† Proc. Ent. Soc. of Washington, Vol. III, p. 234.

‡ Fourteenth Report of the State Entomologist of Ill., p. 87.

**In 1887 Cresson referred this to the genus *Fenusa,* considering it possibly a variety of *F. curta* Norton.

"*Larva.*—The larva is 8.5 mm. in length by 1.25 mm. in breadth, cylindrical, skin minutely roughened. The second and third thoracic segments and the first abdominal are much thickened vertically, giving a convex dorsal outline to this region. From the second thoracic segment the outline slopes rapidly downward to the front, the head being wedge shaped, viewed laterally, and only about half the depth of the second segment. The head is flat beneath, slightly rounded above, about two-thirds as wide as the thorax; antennae and mouth parts very short; eyes wanting. The color is brown both above and beneath First thoracic segment trapezoidal, viewed laterally; a large brown chitinous prosternal area extending forward to the mouth parts and laterally to the legs; a brown patch upon the dorsum of this segment Small brown chitinous sternal areas to the two succeeding thoracic segments, and a still smaller one on the first abdominal.

"Legs very short, not longer than their respective segments; prolegs fourteen in number (counting the two anals), having the form of low, flattened tubercles, each with a brown chitinous patch upon the outer part. The pair of anal prolegs are nearly encircled by two dark brown chitinous arcs.

"Segments of the body deeply separated; sides with two lateral rows of obscure tubercles; spiracles brown, minute, except the first on the middle of the first thoracic segment, which is larger and is surrounded by a small brown chitinous patch"

"Described from a single specimen taken from the blackberry leaf."

My own material in this stage is all alcoholic, and hardly suitable for a close comparison with the above, or for descriptive purposes. Some of the larvae are considerably larger than Forbes' specimen, however, several of them measuring 10 mm in length and 2 mm. in breadth.

The following description of the adult has kindly been furnished by Dr. MacGillivray:

Scolioneura capitalis Nort. ♀. Blackish rufous with the following parts rufous, the anterior and lateral lobes of the mesonotum the scutellum and the post-scutellum; with the following parts white, the two basal segments of the antennae, sometimes, the apices of the coxae, the trochanters, the anterior and middle tibiae and tarsi, and the posterior tarsi; the posterior tibiae varying from a clear white to strongly infuscated; antennae enlarged at middle with the second segment annular, wider than long, the third segment one-third longer than the fourth, shorter than the third and fourth together; the clypeus *truncate;* the clypeal furrow shallow, interrupted at middle by

a distinct, convex hypoclypeal area; the ventral part of the antennal furrows extending from the tentorial invaginations, which are shallow, to a line drawn through the dorsal end of the antennal fovea, and slightly closed just above the base of the antennae by a low, transverse ridge; the dorsal part of the antennal furrow deep at each side of the postocular area, and fading out opposite the anterior ocellus; the postocular area bounded in front by a furrow uniting the antennal furrows of a side, from the cephalic margin of which there extends a wide depression, wider than the ocellus, to the anterior ocellus; the head not with a pentagonal area; the posterior metatarsus as long as all the following segments together; the saw guides straight on the dorsal margin, slightly convex on the ventral margin, and obliquely truncate at apex; the radial cross-vein ending in the cell R4 distinctly before its apex; wings infuscated, veins and stigma brown. Length 4 mm.

Hab.—Missouri (Riley), Illinois (Forbes), Rhode Island (Morse), and New York (Norton).

In notes appended, Dr. MacGillivray says:

"I have before me for study four specimens from the United States National Museum, all from the Riley collection, one bred from a leaf mine on blackberry, two types from Professor Forbes and a single specimen from Rhode Island. This species varies greatly in the amount and intensity of the rufous color on the mesonotum. The type of *capitalis* is apparently an immature individual in which the mesonotal markings are entirely wanting; in other individuals the mesonotum may be entirely blackish rufous, or with only slightly marked spots, or with the body shining black and with distinct rufous mesonotal area. Forbes' *Metallus rubi*, based on males, is black; the male of *capitalis* differs from the female only in having the mesonotum black, and is undoubtedly the same as Forbes' *rubi*, while Marlatt's *canadensis* appears to be simply a form of *capitalis* with a distinct black and rufous color."

In the Fourth Report* of the Delaware Experiment Station (1891) I find a note relative to a leaf-miner in blackberries, which I give herewith:

"Specimens of blackberry leaves infested by a leaf-miner were received June 25, from Mr. P. Emerson, Wyoming, Del., and also from Mr. L. E. Anthony, Smyrna, Del. The insects did not make mines of any particular shape, but destroyed the whole inner portion of the leaves, the upper and lower epidermis of the leaf only remaining.

---

* Report of the Entomologist, M. H. Beckwith.

The leaves were sent to me in a letter and all the insects had escaped. I endeavored to secure leaves that contained the insects, but was unable to do so. Mr. Emerson informs me that several blackberry plantations in that vicinity were quite badly infested and fears were entertained that serious damage would result if the insects continued to increase. I shall make careful observations during the coming season in the infested plantations."

This probably refers to this species, and is doubtless the first published reference to an injury by *S. capitalis* which could be considered as being of economic importance.

Owing to my failure in 1906 to secure the data that I desired relative to the life history of this leaf-miner, I made plans to carefully study the species in 1907; but owing to the unusually cold and wet spring weather that we had, or other unknown causes, the miner appeared in only very small numbers the past season. At the time of my first visit, June 4, I failed to find any of the adults or any signs of mines. On the 27th of June I again visited the place and spent considerable time in the field, but found only six or eight leaves that contained mines. One or two of the larvae in these appeared to be nearly full grown at this date. Some of the infested leaves were brought home and placed in a glass cylinder with cotton batting at top and bottom, and this was set away in my laboratory. On July 9th I found therein a specimen of a species of *Rhysipolis** which had apparently just emerged. This is therefore presumably a parasite upon the larvae of *S. capitalis*.

* * *

Notes on Pachybrachys.

By Fred. C. Bowditch.

These preliminary notes are in the hope that collectors will give this neglected group some attention during the coming season, by collecting series of specimens with special reference to the locality and food plant and so facilitate further and more complete study of this genus.

---

* Determined by Mr. J. C. Crawford, through courtesy of Dr. L. O. Howard.

Through the kindness of Prof. Dr. O. Taschenberg of Halle, Germany, I have received the loan of the types of some of Suffrian's species, so that certain of his obscure forms can be accurately determined, but larger series are needed to define their limits.

The species which figures in our collections as the light variety of *P. striatus* Lec. = *pallidipennis* Suff.; probably Le Conte's name will remain for the so called black var. as a distinct species. The name of *bivittatus* Say should be attached to the species now commonly labelled *viduatus* Fab. The real *viduatus* occurs sparingly in the southern states, is much larger and stouter and has a very well marked M on the thorax. Mr. Löding has sent me several from Alabama and I have it from North Carolina and Georgia. Suffrian's description of *viduatus* fits this species very well and does not fit *bivittatus* at all.

Characteristicus Suff. is wholly grayish-white. I have typical specimens from Lake Worth, Fla., and New Jersey. It is rather flattened in shape; the type ♂ has only one unbroken (by punctures) elytral interspace running along the side from near the humerus. My specimens exactly agree with it in that particular. Query, as to the food plant? It is very close to *atomarius* Mels. which lives on oak.

Impurus Suff. is entirely rust colored with three darker spots on the base of the thorax, and three more along the side and two on the disk of each elytron. My specimens of this are neither of them exactly typical.

Peccans Suff. type is black and yellow, the former color predominating and with a round yellow spot in middle of each elytron. My specimens are not exactly typical. They come from Massachusetts and the Middle States.

Spumarius Suff. type ♂ is still yellower than *peccans* and has also a round spot on the elytra. I have one male example from Tennessee which is the counterpart of the type. Nothing is known of the habits or food plant of any of these four Suffrian species.

I note the occurrence of several Mexican forms from the Southwest, among them *laticollis* Jac. from Brownsville.

Migrating Butterflies.

By P. A. Saverner, Highland Park, Mich.

Point Pelee is a long, tapering point of land, extending from the north shore of lake Erie, about nine miles, near the western extremity of the lake. Out from the Point lie various islands situated like stepping stones across the lake to the Ohio shore. Along this point and its outlying islands, lies a great natural migration route, followed by birds on their vernal and autumnal migrations. During the last three falls I have done considerable ornithological work on the Point, and I have been much interested in observing that not only do birds habitually use this natural highway in crossing the lake, but that there is a regular and well defined stream of Lepidoptera flowing across in the fall. In the fall of 1905 during our stay from September 4th to 15th, we were greatly astonished at the numbers of *Anosia plexippus* present. They were to be seen everywhere, in ones, twos or dozens. In the woods, over the fields or along the roadside, and every here and there on the edges of the woods a tree would be found covered with them. One day, along the east beach, one of the few of the small cottonwoods that grow along the top of the sand dune was so covered with them that the whole lee side was a mass of red, their numbers almost hiding the green foliage completely. When we shook the tree they rose in the air in such a cloud that they could scarcely be seen through. We never saw them flying in flocks except when disturbed in some such manner as described above, when they would either fly to another adjoining tree in a straggling disorganized fashion or gradually scatter, and proceed, each insect for itself. Individuals seldom passed a resting flock but generally joined it and so it seemed that the flocks were built up by the gradual accession of stragglers.

The next year from September 15th to 22d, we saw the same thing but on not quite so great a scale, due likely to the lateness of the date.

This last fall from August 24th to September 6th they were nearly as numerous as during the first season, though we saw no such great masses of them as those on the cottonwood above mentioned. With them we observed two other species numerous that on previous occasions we had not noticed. Not being an entomologist, however, I should hesitate to state that they were not then present. These two were *Papilio cresphontes* and a black swallow-tail not quite so large that I am fairly well satisfied was *P. troilus*. I collected specimens but inadvertently lost them so have to rely upon an uneducated memory and the probabilities. Of these two the former was slightly the more common but both were abundant. I understand that these latter forms are not supposed to migrate but here they were certainly, without exception, flying down the Point and crossing over the lake along the same course followed by the Monarchs. There was no indications of flocking in these two species nor did they seem to associate with each other or with *plexippus* but at all times of the day there was a steady stream of them, making in the same direction, steadily and without loitering.

The Point ends in a long sand pit which we visited almost daily, and on all such occasions, except during rather heavy winds, all three species came sailing out the Point to the extreme end and then launching directly out into the lake along the same route that most of the diurnal birds followed, not toward Pelee Island, the first of the island stepping stones that lies plainly visible some ten miles distant; but taking a more westward line that would carry them straight across the open lake. They came at the rate of about three a minute on fine days and *cresphontes* was the most numerous of them and there were fewer *plexippus* than *troilus*. It was most interesting to watch them come, and observe the regularity and apparent deliberateness of their movements. On calm days they came right down the center of the Point and followed every winding of the final sand spit to its extreme termination from whence they turned and squared away on the course as described before. At times when there was a little wind their proceedings were a little different. As soon as they reached the end of the heavier timber they kept well down in the shelter of the dense red cedar and juniper growth as far as that went, and then crossed to the lee shore, and dropping down to near the water's edge, proceeded along in the cover of the sand dune until the first breath of the wind was encountered when they gradually rose in the air and started over the lake on the usual course. The exactitude with which they followed each other was remarkable. One could stand between two red cedars where they crossed to the shore and ninety per cent. of all butterflies would pass within striking distance of a net. Sometimes a lull would come in their procession and the last would be out of sight in the distance before the next appeared but when it came it would appear beating over the same clump of juniper and within a few yards of the exact spot in which the previous ones first hove into sight.

Whether these were all migrating in the true sense of the word or not I leave to the entomologists to decide. I can just record the facts as I saw them in the hopes that they may be of some interest to others of more experience in the ways of the Lepidoptera. One more fact may be worthy of mention All specimens of *plexippus* seen were in good shape, with unworn wings while most of *cresphontes* and *troilus* were more or less worn, especially the latter, few of which had not lost part or all of their tails and were otherwise damaged though not enough to seriously impair their flight.

Some Larrid Wasps from Colorado.

By S. A. ROHWER, Boulder, Colo.

I wish to express my thanks to Prof. T. D. A. Cockerell for going over my manuscript.

The types of the species here described are in my own collection.

Tachysphex nigrescens n. sp.

♀ Length 6 mm Anterior margin of clypeus rounded out, without distinct lateral teeth, shining, sparsely covered with punctures; front dullish, densely and rather coarsely punctured, vertex shining, the punctures not as dense as those on the front, space between the eyes at the top about half as great as the distance at the bottom; second antennal joint roundish, about one third the length of third, joints three and four equal; dorsulum shining, rather densely and finely punctured, truncate anteriorly; scutellum not as densely punctured as the dorsulum, metathorax dullish; metanotum distinctly punctured, a distinct longitudinal carina from middle of base extending to about the middle; lateral and posterior faces distinctly striated; posterior face with a shallow, circular fovea; abdomen shining, densely covered with extremely fine punctures; pygidium, narrow, obtusely pointed at apex, somewhat excavated above. Color black; palpi pale brownish; apical part of tegulæ, a narrow band on apex, and extending along side of each abdominal segment, apical joints of tarsi (more especially the posterior ones) reddish brown; face, pleuræ and inner side of tibiæ with sparse sericeous pubescence. Wings dusky hyaline, nervures dark brown.

Habitat.—Florissant, Colo., June 28, 1907 (S. A. Rohwer).

Known from *T. intermedius* Vier. (Douglas Co., Ka.), its nearest ally by its smaller size; front without groove between ocellus and insertion of antennæ; abdomen not, or but very slightly, covered with silvery pubescence.

In Fox's table in N. Am. Larridæ it runs to 17 where it runs out, falling between *punctifrons* and *aethiops.* It may be known from both of these by its smaller size, and from *punctifrons* by the absence of the dense sericeous pile, and from *aethiops* by the much clearer wings.

Tachysphex hitei n. sp.

♀. Length about 8½ mm. Clypeus truncate with a very minute obtuse lateral tooth, densely punctured except on the extreme apical margin which is shining; front densely, rather coarsely punctured; vertex with finer punctures; a somewhat indistinct line-like depression from lower ocellus to between antennæ, and a broader and more distinct one from ocellus to occiput; the depression behind lateral ocelli distinct; distance between eyes at the top about equal to the length of antennal joints two plus three; second antennal joint about one-third as long as third, dorsulum somewhat truncate at anterior margin, densely and finely punctured in general, but a spot on each anterior part more coarsely punctured; scutellum and postscutellum punctured like the greater part of dorsulum; metathorax densely punctured with medium size punctures, on posterior face there is a distinct elongate fovea; abdomen distinctly, though finely punctured above and beneath, ventral segments with a few long reddish hairs; pygidium distinctly margined, about twice as long as the width at base, apex sharp, very finely punctured, with a few widely scattered large punctures. Color black; apical tarsal joints rufous; abdomen clear red, with triangular shaped patches of silvery pubescence on apical lateral margin on the first, second and third segments (this pubescence can only be seen in certain lights); face, pectus and lower part of pleuræ with silvery pubescence. Wings dusky hyaline, nervures black.

Habitat.—Jim Creek, Boulder Co., Colo., September 7, 1907 (Glenn M. Hite).

The pygidium is similar to that of *triquetrus* Fox (Nev.) but it is not that species.

Disregarding the pygidium it runs in Fox's N. Am. Larridæ, to *tarsatus* Say, but differs from that species as follows: punctures on the dorsulum not uniform throughout; posterior face of metathorax not striated but punctured; abdomen above with fine punctures; smaller size, etc.

It also seems related to *T. punctulatus* H. S. Sm. (ENT. NEWS, Sept. '06, p. 246) from Nebraska, but may be separated from that species by these characters; clypeus densely and rather coarsely punctured; different puncturing of the front; scape and mandibles without rufous; differently punctured dorsulum; abdomen clear red, with silvery pubescence at sides of first three abdominal segments, etc.

Tachysphex foxii n. sp.

♀. Length 8 mm. Clypeus rounded anteriorly, the apical margin slightly uneven, lateral teeth if present very small, rather densely punctured throughout; front with large well separated punctures, punctures on vertex not quite as dense; a distinct furrow from lower ocellus to near occiput; depression back of lateral ocelli rather distinct; space between eyes at the top a little more than the length of antennal joints three plus four; dorsulum, scutellum and postscutellum shining with distinct well separated punctures; mesopleuræ and pectus similarly punctured; metathorax above reticulate to coarsely granular; metapleuræ densely coarsely punctured; posterior face somewhat indistinctly striated, with a distinct elongate fovea, which is wider at the top; abdomen with fine dense punctures above, except the apical margin of the second and following segments which are shining and without punctures, venter shining, without or with very few punctures; pygidium margined, about twice as long as the width at base, with a few widely scattered punctures. Color black, band on middle of mandibles and two apical segments of abdomen rufous (abdominal segments brighter rufous); sides of abdominal segments, face, lower half of front, pectus, pleuræ somewhat, dorsulum, metanotum and posterior face of metathorax sericeous; wings hyaline, at extreme apical margin dusky; nervures dark brown.

Habitat.—Boulder, Colo., Aug. 30, 1907 (S. A. Rohwer).

Dedicated to Mr. W. J. Fox who has done so much to make North American Larridæ known.

In Fox's table (N. Am. Larridæ) this species runs to *T. acutus* Patt. (Conn., Ga., Fla.), but differs in the following points: occiput not emarginate when viewed from behind; front with distinct punctures; metapleuræ punctured; pygidium not more than twice as long as broad at base; apex of abdomen red, etc. It has much the general appearance of *T. terminatus* Sm. but differs greatly in sculpture. It is not *T. claronis* Vier. (Tr. Am. Ent. Soc., 1906) which is an ally of *T. terminatus* Sm.

Tachysphex foxii var. **alpestris** n. var.

♀. Differs from *T. foxii* in having the front more densely and finely punctured; the dorsulum more closely punctured; the two apical joints of the tarsi rufous; the metanotum with a little more gray hair; and is a trifle smaller.

Habitat.—Florissant, Colo., July 1, 1906 (S. A. Rohwer).

This variety comes nearer *T. terminatus* Sm. but is still quite distinct. It runs in Fox's table (N. Am. Larridæ) to *T. acutus* Patt.

Tachysphex parvulus Cress.

A ♂ collected at Florissant, Colo., June 15, 1907 (S. A. Rohwer), differs from the description of this species given by Mr. Fox (N. Am. Larridæ) as follows: First joint of tarsi reddish; the three apical segments and apical half of third black; base of first abdominal segment black; pubescence of face a trifle yellowish; tegulæ ferruginous; venation pale brown; length 5 mm.

Tachysphex æthiops Cress.

♀ Copeland Park, Boulder Co., Colo., September 6, 1907; N. Boulder Creek, Boulder Co., Colo., August 22, 1907, Canadian Zone. Both specimens taken by S. A. Rohwer.

Notogonia argentata Boe.

Boulder, Col., April 14, 1907, and August 30, 1907 (S. A. Rohwer).

Niteliopsis plenoculoides Fox.

Florissant, Colo., June 22, 1907 (T. D. A. Cockerell).

Tachytes crassus Patt.

A ♀ from Boulder, Colo., August 26, 1906 (S. A. Rohwer), has four silvery bands on the abdomen, which would tend to run it into *T. columbae* Fox but the pubescence on the face is golden and the longest spur of the hind tibiae is as that of *T. crassus*. Again *T. crassus* is known to occur in the west while *T. columbae* has not been recorded from the west. I have seen a typical specimen of *crassus* from Roswell, N. M. (Ckll.). This locality is new.

Notes on some Angolan Insects of Economic or Pathologic Importance.

By F. Creighton Wellman, Benguella, West Africa

(Concluded from page [illegible])

17.

No. 102. *Zonabris trifurca* Gerst. (Colept.)

This Meloid beetle is a prominent member of a group deserving mention because of their flower-feeding habits. Both flower and vegetable gardens suffer from their presence. As they occur in large numbers they are not easy to combat. Their life cycle is interesting in that their larvae are parasitic in the oothecae of Orthoptera. These beetles are very distasteful to most insect eating animals, and are consequently wonderfully mimicked by widely different groups of insects. I am publishing in another journal* a study of this interesting subject.

18.

No. 17. *Sarcopsylla penetrans* L. (Siphonapt.)

The flea locally known as the "Ewundu" is a common pest throughout southwest Africa. It was brought to this country in 1872 by the Portuguese from South America. Since then it has traversed the continent and is steadily pursuing its way around the world, having already been carried by coolies from East Africa to the Far East. *S. penetrans* in Angola lives in the dust, etc., on the floors of native Kraals, camps, etc. It bites all warm-blooded animals, including man, in the same manner as do ordinary fleas; but if a ♀ be impregnated, she takes advantage of her first chance to burrow into the tissues of some warm-blooded animal (often man) thereby occasionally causing tetanus, sepsis, gangrene, mutilation and (rarely) death of her host. Once ensconced, she matures her eggs, her abdomen, which admits of enormous distension, swelling during the process to the size of a sweet pea. There have appeared various accounts of the succeeding steps in the metamorphosis, many of them inaccurate. In books on zoology, pathology and medicine we read, for instance, such statements as these: The eggs are "not deposited while the parasite is in the skin, for the ova do not leave the body until the parent reaches the soil." "The female bores into the skin, and the escaping larvae give rise to ulcers." "The female lays her eggs in the skin and causes thereby intense inflammation." "After the eggs are laid (according to some before this process) the superjacent skin ulcerates and the chigger is expelled," etc., etc. During the examination of large numbers of natives in Angola, I have made the following observations, already published in another periodical,* concerning this disputed stage in the life history:

---

*Deut. E. Entomolog. Zeits.

1. The eggs are always laid while the chigger is yet imbedded in the flesh of her host.†

2. They never hatch into larvae in the body of the parent.

3. They are not laid at one time in masses,† but discretely and sometimes at considerable intervals.

---

*American Jour. Med. Sciences, May, 1906.

†When artificially removed from the tissues of her host she behaves abnormally and extrudes all her eggs at once, but this does not form a real exception to the above statements, and only a few of the most mature eggs thus expelled will hatch out.

4. The shell of the parent, when dead and empty of eggs, usually dries up *in situ* without causing further trouble.

5. The eggs once having reached the dust of the floor develop precisely like those of many other fleas.

In the light of what has been said it will be seen that so long as natives go about with infected feet, chiggers will abound. Domestic animals, too, should be kept at some distance from white quarters and the floors of bungalows should be occasionally sprinkled with naphthol or kerosene. I have several times pointed out* that this flea is one of the principal factors in the production of the tropical disease known as Ainhum.

19.

No. 1067. *Calandra oryzae* L. (Coleopt.)

This troublesome weevil is a great nuisance in stores of mealies (maize) and other grain. A moth (not yet heard from) shares with it this evil reputation. The native blacks in order to preserve their seed corn, store it in earthen pots the mouths of which they seal with clay. The local name for the weevil is "Omelekese."

20.

No. 876. *Dorylus nigricans* Ill. (Hymenopt.)

This is the hated "army ant" of this district. Having been several times driven from my tent by them I can personally testify to their mandibular powers. In former days a favorite method of punishment inflicted by the native chiefs was to bind hand and foot the victim who was then thrown into a nest of "army ants" here called "Ovisonde." Careful housewives, however, welcome the approach of the ants and joyfully vacate for them the bungalow. For after a column of "army ants" has minutely explored a dwelling not a bug, beetle, cockroach, mouse, rat, snake or other pest remains behind! Much has been written on the habits of these and related ants, so I will not extract in detail from my notes the observations there recorded concerning their column formations, tunnelling under streams, forming living bridges over water, removing or elevating obstacles from their line of march, etc., etc.

---

*Jour Trop Med, 1906 p 31; Boston Med. and Surg Jour., 1906 p 489.

21.

No. 1441 *seq*. *Diacantha spp*. (Coleopt.)

There are a number of noxious Phytophaga which might be mentioned. Those named in the title of this note feed on Curcurbitaceae and especially destroy melons and cucumbers. Other allied beetles: *Monolepta ludrica* Wse., *Melinotoma spp.*, etc., also Curculionidæ, larvæ of Elateridæ (*Tetralobus mechowi* Qued., *et al.*), etc., are also common garden pests. My noxious Hemiptera and Lepidoptera have not yet been reported on.

22.

No. 1156. *Simulium damnosum* Theob. (Dipt.)

This tiny fly is possibly one of the most successful destroyers of patience and provokers of profanity in the Colony. Natives near wet plains sometimes are compelled to move their kraals on account of it, and I have had to break camp to escape a swarm. It crawls down one's neck and up one's sleeves and bites viciously, leaving a tiny red wheal which itches furiously and does not disappear for some time.

23.

No. 179. *Apis nigritarum* Lep. (Hymenopt.)

The common Angolan honey bee. The species, described from the Congo, is by some regarded as only a variety of *A. adansoni* Latr., and some authors regard both these forms as varieties of the common European honey bee. I have it on the authority of Professor Cockerell, however, that our Angolan *nigritarum* is not to be identified with the European species. The insect is of considerable economic importance, as the natives eat the honey; and beeswax is one of the chief exports of the colony. The hives are made of hollowed out pieces of log (sometimes of bark) and are hung or lodged in trees. Particular trees are considered to be good "bee trees" and are always provided with hives. When full, the bees are simply smoked out of the hives and allowed to go off to find another home. No attempt is made to keep them, or to attract new swarms. It may be said in passing that the Apidae of

Angola are of great interest, my small collection having already turned up several fine new forms, including a new genus The peculiar abdominal pouches of the Xylocopid group, enclosing parasitic mites (*Paragreenia* Ckll.) is also most interesting, as is the mimicry and parasitism in the whole family.

24.

No. 1554. *Tabanus biguttatus* Wied. (Dipt.)

This fly is representative of the powerful group which includes, in my collection, several new species. *T. latipes* Macq is the handsomest member, while the one named in the title to this note is of special interest on account of its mimicry of a wasp. The two species here named, with several others (notably *T. socius* Walk. and *T. rubricundus* Walk.), make life a burden to cattle, and occasionally attack man.

25.

No. 1060. *Clytus semiruber* Qued. (Coleopt.)

A common Cerambycid beetle (represented here by a variety, probably new) which is typical of a large group. They do great damage to dry timber. *C. semiruber* (which is distasteful and rejected by insect-eating animals) is a Mullerian mimic of *Zonabris dicincta* Bert.

26.

No. 1555 *seq.* *Salius spp.* (Hymenopt)

Such formidable wasps as *Salius vindex* Sm., *S. dedjas* Guér., and *S. regina* Sauss., are reinforced by scarcely less powerful representatives of *Scolia*, *Synagris* and *Sphex*. The number of species is very large in the region, and the more aggressive ones are best left alone. I once saw a gigantic *Salius* chase a native boy several rods. The sting of such wasps is severe. The group as a whole is a fine one and several of my specimens are new to science.

27.

No 1246. *Haematopota ocellata* Wied. (Dipt)

I have taken a considerable number of *Haematopotae* nearly a dozen of which have been pronounced new species These flies are a terrible pest in the wet season, both to men and animals. The nearly naked natives suffer badly, and I have seen even a phlegmatic donkey become excited over them. One sometimes sees a horse or mule with the side of its neck almost literally covered with the tormentors. They will bite through thin clothing.

28.

No. 63. *Anthia calida* Har. (Coleopt.)

The commonest of a group of valiant Carabidae, some of which are much larger than *calida*. When disturbed they eject an acid secretion from the end of the abdomen, which, if it reaches the eyes, causes pain and may induce inflammation. A large ant shares the same habit. A small snake defends itself in a similar manner, spitting venom several feet. I was once inclined to doubt the existence of the last named animal, but I finally saw the phenomenon with my own eyes.

29.

No. 1156. *Aulacaspis sp.* (Hemipt.)

A scale insect attacking the Grenadilla vine (*Passiflora edulis*) and the "Ocimania" tree (*Papaya vulgaris*). It was probably brought here on a tree (*Melia azedarach*) imported from Portugal and called by the colonists "Sycamore": or at least the scale seems to be very fond of this last species. This *Aulacaspis* is typical of a large group of scale insects which I have not yet been able to study carefully.

30.

No. 22. *Diamphidia locusta.* (Coleopt.)

This Chrysomelid beetle is by far the most startling insect in the list; for from its grub is extracted the lethal arrow poison of the Bushmen and their neighboring tribes. On the occasion of my first visit to Africa I had a specimen (larva) brought me, but was naturally very skeptical as to the statements accompanying it. The blacks told me that the bite of either the imago or the grub was fatal, and that either is used in preparing the arrow poison. Correspondence with various savants, however, has verified the local opinion of the deadly nature of the beetle, and I have according described my larva in another journal.* Various other substances are mixed with the powdered grub, chiefly the watery extract of the bulb of *Haemanthus toxicaria*. In former times various species of *Strophanthus*, especially *S. lanosus* were also used.

---

*Deutsch Entomolog. Zeitschrift, 1907 p. 17.

31.

No. 870. *Pheidole punctulata* Mayr. (Hymenopt.)

These tiny ants are a troublesome pest. They are into everything. A dish of food, unless placed on a table the legs of which are set in tins of water, is almost immediately scented and explored by them; and in the dry season even a glass of water in a few minutes has a lot of them floating in it. Housewives are driven to despair and native cooks endure hard words and blows on account of *punctulata* the local name of which is "Olunjinji." Other ants in a less degree are guilty of the same proclivities. The ants of Angola seem to be closely allied to those of South Africa, and as yet only one new form has turned up in my collection.

32.

No. 133. *Epicauta sp.* (Coleopt.)

A plant-feeder and, like several of the preceeding, undesirable to have in the garden. This beetle is destructive to the flowers of potatoes and to bean plants. I should say before dismissing it, that this Meloid, if dried and powdered, will produce blisters just as do *Lytta vesicatoria* L., *Zonabris cichorei* L., *Z. pustulata* Thunb. and the other species used medicinally in different countries. I am elsewhere* writing of the remarkable mimetic relations of Angolan *Epicauta* with other insects

A study like the present must always remain incomplete I hope, however, to add to the preceding observations other notes on the most interesting or important insects (from an agricultural or pathological standpoint) that come to my notice during my proposed collecting tours in West Africa In conclusion I wish to thank several correspondents for determinations of specimens, among whom I must mention Professor Cockerell, of the University of Colorado, Dr. Forel of Yvorne, Switzerland, and especially my friend Dr W. Horn of Berlin, the President of the German Entomological Society.

*Vide Deutsch. Entomol. Zeits.

Callosamia angulifera Wlk., n. var. carolina.

By Frank Morton Jones, Wilmington, Del.

♂.—Ground color of wings above, black, obscured basally with olive-brown hairs and more or less heavily overlaid with golden-brown scales. Discal mark, on primaries, yellow and prominent; on secondaries, absent or very faintly indicated. Transverse posterior line yellow, clearly defined interiorly, outwardly fading into a broad, powdery golden-brown area. Secondaries beneath with no light line; purplish-red, with no strongly-contrasting areas.

♀.—Very similar to typical *angulifera* above; the discal marks yellow, almost obsolete on secondaries. Beneath, the black transverse lines of *angulifera* are replaced with purplish-red, which also darkens the area beyond to as dark a tone as the remainder of the wing.

Described from fourteen males and ten females from Berkeley County, South Carolina.

◆

The Carpenter Mud Wasp (Monobia quadridens).

By M. Tandy, Dallas City, Ill.

During the summer of 1907 it was my good fortune to come in possession of a very interesting and rare specimen of the nest containing the live pupae of the Carpenter Mud Wasp.

Usually this insect selects some partly decayed board in which to excavate its tunnel for a nest, which is usually several inches in depth, and partitioned off into cells about one inch each, in which are stored spiders; and one egg deposited in each cell.

Now this particular insect, the subject of this sketch, seemed to be of different mind from the rest of its kind, as is exhibited in its selection of new and partly manufactured material for its domicile.

Perhaps it had caught the spirit of the age of progress and invention, and responded to some mysterious and inexplicable desire to better its condition, to provide a newer if not more fashionable home, or it never would have invaded a sash and door factory to provide for the same, and select the best of finishing lumber—a block of cypress, which had been discarded in the manufacture of window frames—dressed on both sides and with a groove in the under side, as it reposed upon a lumber pile. On its upper side were six small partly decayed places, which bear evidence that our insect novice still retained some of its "old fogy notions" by its efforts to excavate a tunnel for its home, in each of these decayed places, and abandoned them by reason of the silicified layers intervening between the annual growths, which are peculiar to this particular variety of wood, and which cause much trouble and annoyance to the manufacturer. What our little novice lacked in botanical wisdom it made up by experience, and we can imagine that, though it was thoroughly disgusted with its failure it still retained the proverbial "grit" of this family of insects, by the ready manner it adapted the mechanical groove in the block of wood to its own purposes. It now appears that our little novice made the best of its environments, and enlarged its plans in advance of any of its kind by planning a larger and more magnificient domicile, and proceed to divide up its newly acquired premises into twelve rooms and cells, neatly partitioned off with mud. In Comstock's Manual for the Study of Insects, page 658 is illustrated a nest of this insect, composed of five cells, but in this case, it was a home built with its own hands (?) and exertion—hence it did not feel equal to, or had no desire, provide a larger or more commodious domicile, as did the subject of this sketch.

Later in the season when a workman had occasion to take some material from this pile of lumber, in lifting the block containing this interesting specimen he discovered the peculiar and new form, and consulted the writer as to its identity

The block being separated from the smooth plain surface of the plank below, exhibited a very perfect cross section view of the nest containing the live pupae, and each pupa suspended in fine web so that it did not come in contact at any point with the walls of its cell, and no visible remains of food material with which the cells were first stored. The pupae are exactly, in shape and appearance like a very slender medicine capsule filled with a dark chocolate colored material and capped with white.

Thus, in many ways the interesting insect world contributes to the curiosity and wonder of the human kind.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MAY, 1908.

Probably there is no entomologist who can recall without sadness or bitterness some favorable collecting place wiped out of existence by the extension of towns or cities, or by the removal of woods and thickets. Even without mentioning the necessity of forests as sources of lumber supply, as conservers of moisture, as health-restoring agencies and as recreation-areas, our fraternity ought readily to sympathize with those who are doing what they can to save the few large tracts of woodland which still remain in the eastern United States. One of these is in the White Mountains of New Hampshire, another is in the Southern Appalachians. Bills to acquire these two areas as federal forest reservations are now before the House of Representatives at Washington, and have been approved by the American Civic Association. At the present writing these bills are in the hands of the Judiciary Committee of the House where, some fear, they will slumber undisturbed until the end of the session.

Let all those who desire to see their country's natural resources preserved and strengthened, all those who love nature and out-door life, all naturalists, botanists and entomologists do their utmost by spoken word or written letter to make clear to their Representatives and Senators at Washington that these forests must be acquired for the Nation and forever by action of this present Congress.

It is suggested that in addition to the members from each one's own state and district, letters and resolutions insisting on such action be addressed at once to the speaker, Hon. Joseph G. Cannon; Hon. John J. Jenkins, Chairman of the Judiciary Committee; Hon. James A. Tawney, Chairman of the Appropriations Committee; and the Hon. Charles F. Scott, Chairman of the Committee on Agriculture, House of Representatives.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

MISS EDITH PATCH, State Entomologist of Maine, has been spending a few months at Cornell University.

IT IS announced that Dr. Thos. H. Montgomery, Jr., of the University of Texas, has been called to the head of the Department of Zoology of the University of Pennsylvania.

PROF. M. V. SLINGERLAND, has just returned from Chicago, where he has been investigating the insect enemies of twine string, for the McCormick Reaper & Binder Company.

THE first number of the Annals of the Entomological Society of America has appeared. It is a credit in every way to the Society and the Editorial Board. If future numbers maintain the same standard of excellence its future will be assured.

DURING the past season two distinguished foreigners, Messrs Walter Froggatt, Government Entomologist of New South Wales, and Dr Manuel J. Rivera, Entomologist of Chili, have visited various entomological centres in the United States.

CHARLES ABBOTT DAVIS, curator of the Roger Williams Park Museum, Providence, Rhode Island, died Jan. 28th. He was deeply interested in entomology and published a number of papers on the subject, and possessed a valuable collection of insects.

THRIPS TABACI LIND. This insect has appeared in enormous numbers on onions at Yuma, Arizona, a place where (as I learn from Prof. R. H. Forbes) onions have not been grown before. I am indebted to Mr. Crane, of Yuma, for specimens. T. D. A. COCKERELL.

MR. E. P. VAN DUZEE, has left for a month's collecting trip to Southern Florida. He wishes to look up the subtropical forms of *Hemiptera* and will make as large collections as possible. His brother M. C. Van Duzee will go as far as Jacksonville with him and collect principally *Hymenoptera*.

WHILE collecting on Puget Sound during the summer of '07 a number of mollusks were collected and cleaned. When unpacking the shells on my return I found that a fly had oviposited in a number of the shells, pupated and emerged, being held by the paper about the shells. The specimen proved to be the blow fly *Calliphora* sp.

The shells of *Pterorhytis foliatus* furnished the largest number of flies but other shells had also harbored them. The shelter of the shell and the food offered by the remains of the body of the mollusk which had not been entirely removed had furnished a very satisfactory home and host for the flies. In most cases only a few flies had reached maturity possibly because of inadequate food. J. W. HUNGATE.

ODONATA from the Huachua Mts., Arizona.—The two species of *Argia* mentioned in the list on page 45 of the NEWS for Jan., 1908, are *A. tonto* Calv., and *A. vivida*, var. *plana*, Calv.—P. P. CALVERT.

ON A DROLL STORY OF A GERMAN SCHOOLMASTER AND A U. S. A. MAJOR.—BY DR. WALTHER HORN (Berlin).—There was once a thin little schoolmaster in Germany, called "W. H." He was little and thin, as generally German schoolmasters are.

There was once also a large, big major in the U. S. A. named "Th. L. C.," an important fellow—a real Major.

The Major went out early in January, 1908, to fight against the schoolmaster.

The schoolmaster got awfully frightened. Poor little schoolmaster, what could he do?

The schoolmaster tried to write an epistle against the furious Major, but as often as he began to write "Th. L. C.," he wrote "Mo. T. Sch."—his "sense of intellectual perception" was really "very feebly developed." Finally he got an idea: he went out to catch two different grasshoppers, put each one in a separate glass, labeled them carefully "Th. L. C." and "Mo. T. Sch.," thinking that will help his memory to facilitate the distinction. Really the epistle advanced; but, alas, the next morning came, "Th. L. C." had moulted and looked now like "Mo. T. Sch."

Poor little schoolmaster, how were you taken in again!

There was still a little schoolboy named "H. R.;" clever in everything, only he had never succeeded in differentiating a positive from a comparative. He saw his master's sorrow.

"Master, what's the matter?"

The master told his bad story.

"Can I see the two grasshoppers, master?"

"Yes, my little boy, here they are."

"How are the mouth-parts of them, master?"

"Just the same!"

"And the claws"?

"One like the other!"

"How do the bugs spring, master?"

"Absolutely the same behavior!"

"Well," said the clever boy, "the bugs are really the same, only "*Casey*" should be perhaps the comparative of "*Motschoulsky*."

EFFECT OF THE PARASITISM OF TACHINA FLIES ON THE LARVAE OF *Phlegethontius sexta* JOHANSSEN.—At Paris, Texas, on September 6th, 1904, I found a nearly fullgrown larva of this species hanging head down from a tomato plant in a garden, the anal prolegs holding it. The body was limp, shrunken and decomposed, and literally full of the grubs of some tachina fly. Afterwards the body hardened and became brittle, finally cracking along one side, through which the maggots worked their way out. Eleven of them pupated on the surface of the soil contained in a jar in the laboratory, while ten more pupated within the body of the host, the last three segments of which were packed tightly with them. Otherwise, the entire cavity of the body was empty. Twenty-one (21) flies were reared from this single larva. The length of the pupal instar of the fly from September 10th to September 27th, was 17½ days, probably lengthened somewhat by the dryness of the soil in the confining jar. The variation in size of the puparia was marked, ranging in length from 8.10 to 4.90 mm. with all gradations.

On October 8th and 9th, the grubs of this species of tachina fly were again found in two *sexta* caterpillars from tomato plants, and twenty four (24) puparia were afterwards obtained from the hosts, averaging twelve (12) apiece. But four of these flies had emerged up to November 16, 1904. The two hosts showed symptoms similar to those of the first case. This parasite was kindly determined for me by Mr. C. H. Tyler Townsend, Division of Insects, U. S. National Musuem, as "*Argyrophylax protoparcis* Towns. (or a n. sp.?)."—A. A. Girault, Paris, Texas.

* * *

Doings of Societies.

At a meeting of the Entomological Department of the Harrisburg Natural History Association held in the rooms of the Division of Zoology on the evening of April 9th at 8 o'clock, a resolution was passed to the effect that, hereafter an abstract of the minutes be submitted to the ENTOMOLOGICAL NEWS for publication in its columns. In the absence of the regular chairman, Mr. P. H. Hertzog consented to preside. Mr. Henry L. Viereck then spoke at some length on "The Possibilities of a Universal System of Scientific Nomenclature." He first gave a short review of the history of the Linnean System of nomenclature and of the difficulties which had been encountered in recent years because of the enormous increase in the number of described forms in all branches of zoology.

It became necessary that many points be arbitrarily defined in order to prevent inextricable confusion. He mentioned the work of the International Zoological Congress telling what it had accomplished and what it still hoped to do.

Mr. Warren S. Fisher then presented a paper on "Insects Injurious to Forest Products." Emphasizing the importance of the study of forest entomology, he outlined the methods of work and study necessary for the student in this branch of entomology.

The insect fauna of forest products then received some attention and the economic relation of insects to forests was discussed.

After touching the subject of remedies and methods of preventing losses Mr. Fisher concluded with an interesting summary of the annual losses occasioned by insects to forest products and also to growing timber.

W. R. WALTON, *Secretary.*

The February meeting of the Heink Entomological Club of St. Louis, Mo., was held on the 16th of the month, Mr. C. L. Heink in the chair and nine members present.

Mr. Graf exhibited a dwarf specimen of *Catocala piatrix,* being less than half the usual size.

Mr. Schroers showed a pair of *M. pallescens,* taken at Jefferson Barracks, Mo.

Mr. Poepping displayed several *Rhodosia julia,* taken in north St. Louis.

Mr. Heink exhibited three specimens of *Ufeus sagittarius* taken in north St. Louis on the river bank, January 4, 1903; also a fine specimen of *Euerythra phasma* and a pair of *Euclea indetermina* bred from larvae taken at Meramec Highlands, Mo.

Mr. Knetzger exhibited a series of *P. asterias,* all bred, showing remarkable variation in the number of yellow spots (inner row) of the secondaries, one specimen being entirely devoid of these spots, another having but one spot, another two and so on up to the specimen with the full number of eight spots. The question as to whether the larvae of *P. asterias* showed proportionate variations in markings was discussed, since the black rings of the larvae producing females are much more pronouncedly marked than the rings of those producing males.

Mr. Kelbly read an interesting paper on his experience with various methods for the preparation of larval skins.

AUG. KNETZGER, *Secretary.*

The Heink Entomological Club of St. Louis, Mo. held its regular monthly meeting on March 14th, Mr. C. L. Heink, presiding and all members present.

Mr. Schroers reported that on February 14th a seemingly perfect specimen of *P. cresphontes* flew into his office through an open window, but escaped before he could make an effort to capture it.

Mr. Heink exhibited a large series of *Anthocharis*, including *A. genutia* and *A. olympia*, local forms. He stated that during many years of collecting about St. Louis, he has taken *olympia* almost every year, during the month of April, but only in one certain locality.

Mr. Poepping exhibited a series of *Conchylodes platinalis* which he found in abundance last season.

Mr. Kelbly reported having taken that morning (March 14th) a fresh specimen of *E. claudia*, the wings of which were still flabby.

AUG. KNETZGER, *Secretary*

The monthly meeting of the Brooklyn Entomological Society was held February 6th, President Pearsall in the chair and fifteen members present, with four visitors.

The evening was devoted to listening to an illustrated lecture by J. J. Levison, of the City Department of Parks, who has charge of the shade trees throughout Brooklyn and whose subject was: "the Enemies of our Shade Trees and Practical Methods of Combatting Them."

Insect enemies in Brooklyn are chiefly the tussock moth N. *leucostigma* and the borer *Zeuzera pyrina*. The city is divided into districts for the *leucostigma*, each cleared in turn by scraping off the egg masses and burning them. Unfortunately the department has no supervision over back yards and other private property and the very people who make the most urgent requests upon the department are the ones who would not spend ten cents on bands to keep a fresh brood of caterpillars from ascending the trees. The only way to fight the *pyrina* is to pour a little carbon bisulphide in each caterpillar tunnel and plug it.

The bagworm *Thyridopterix ephemeraeformis, Datana, cecropia, cynthia* and *Hyphantria cunea* have been troublesome only locally and are easily picked off.

Fungus growth does far more harm to the shade trees than all insects combined. The Northern Maple and Oriental Sycamore are recommended for planting along the streets. The poplar has proved so unsatisfactory that its planting is now forbidden. R. P. Dow, *Recording Secretary.*

The Brooklyn Entomological Society met at 55 Stuyvesant Avenue, March 5, 1908, President Pearsall and eleven members present.

There has been added to the archives of the Society a valuable collection of photographs of prominent entomologists of the world, presented by Mr. E. L. Graef. It was decided that each present member of the Society contribute his photograph and notice of his entomological career, in the hope that one or more, in subsequent years, achieve equal fame.

Mr. A. C. Weeks spoke on "A method of propagating and preserving insectivorous birds and constructing suitable nesting boxes."

Mr. Franck exhibited two specimens of *Hepialus auratus,* both males but dissimilar in size, taken by Mr. Pearsall on the summit of the Catskills. They were found sitting in dense woods. Less than half a dozen specimens of this species are known.

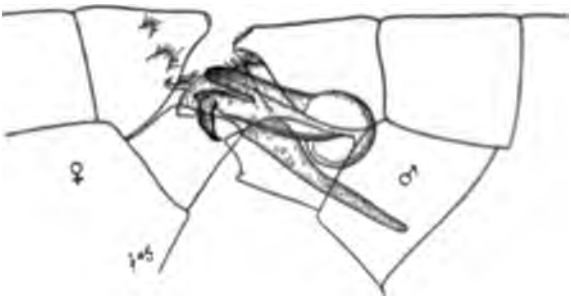
The black aberration of *Colias philodice* ♂ from Mr. Franck's collection, taken at Bethlehem, Pa., was closely examined. It is in ex larva condition. The inner portion, normally yellow was even a shade darker than the normally black margin of the primaries. The line of demarcation is perfectly distinct. The specimen retains the pink margins, especially of the secondaries, which is most marked in first and second broods.

Mr. Engelhardt exhibited a *Brenthis myrina* ♂ taken by him at Overbrook, N. J., May 30, 1907. Its ground color was a rich chocolate, varying from almost black next the body to a shade darker than normal at the margins. Its structure and its companionship with plenty of other *myrina* are all that identify it.

R. P. Dow, *Recording Secretary.*

At the regular meeting of the Feldman Collecting Social held March 18, 1908, at 1523 S. 13th St., Philadelphia, 14 members were present, Mr. Englehardt of Brooklyn, visitor.

Professor Smith reported on the study made of the genitalic structure of *Macrobasis ochrea*. He finds that there is a distinct correlation between males and females, so that copulation is rather difficult between specimens of markedly different sizes. A small male can copulate with a large female; but it would be difficult for a large male to copulate with a small female. The male organs are furnished with a hook and in copulation the lower part of the terminal segment of the male slips under the lower part of the last abdominal segment of the female. The hook engages a slight thickening on the inner rim of the female segment and the lock is complete. It is almost impossible to get the specimens apart by a direct pull. A figure was exhibited which brought out these characters more clearly.



Professor Smith also read an interesting letter from Dr. S. S. Haldeman dated March 18, 1849, and addressed to Mr. J. H. Blakely, professor in W. F. Collegiate Institute of Wilmington, Del., giving details of how to collect and mount insects, same being explained by sketches.

Mr. Englehardt made some remarks on the New York and Brooklyn Societies and exhibited a box of *Memythrus* showing the life histories and the great variation of this group and an undescribed variety and also explaining the habits. Discussed by the members.

Mr. Greene read a Dipterous communication from C. T. Greene on *Platypeza ornatipes* Townsend. Mr. Aldrich described this genus and its typical species from Champaign, Ill., in 1894. It has since been taken in Ithaca, N. Y., and Brookings, S. D. Mr. Greene took a ♂ specimen of this species at Lehigh Gap, September 25, 1906, sitting on leaf of wild grape, making the fourth record of its capture and the first in Pennsylvania. It has remarkable hind tarsi, a drawing of which was shown from Aldrich's paper in ENTOMOLOGICAL NEWS, 1906, p. 123, fig. 2.

Mr. Viereck mentioned larvae taken from decomposed maple and exhibited photo of same which is most likely a *Mallota.* He also showed photo of larvae taken from stomach of horse most likely *Gastrophilus equi.*

Mr. Kaeber said he had found larvae in hickory shoots (which had been injured by fire) at Clementon, N. J., in the spring of 1906. Judging from the amount of work done in the wood they had undoubtedly been there in the summer of 1905. The imagoes were cut from the same wood March 15, 1908, and turned out to be the Longicorn *Stenosphenus notatus.*

Mr. Wenzel had on exhibition the Coleoptera collected in Arizona last summer by his son Mr. H. A. Wenzel while in company with Mr. Kaeber. These filled twenty-one boxes and approximated 12,000 specimens. He made remarks on same, mentioning rarities and new species.

Dr. Skinner congratulated them on the fine collection and spoke of his trip to the same locality.

Mr. Huntington explained the new Lumiere color photography process.

Prof. Smith said his photographer had experimented with these plates and had succeeded in making beautiful lantern slides.

GEO. M. GREENE, *Ass't. Secretary.*

OBITUARY.

JAMES H. RIDINGS.

Mr. Ridings died suddenly on April 17th from paralysis of the heart. He was born in Philadelphia, June 12, 1842. He was the son of the late James and Diana Ridings. His father was a distinguished Philadelphia Entomologist and one of the founders of the Entomological Society of Philadelphia, afterward the American Entomological Society. Mr. Ridings was also fond of entomology and took a warm interest in the welfare of the American Entomological Society, having been its recording secretary for twenty-four years, serving from September, 1873 until December, 1897. He was a member of the Academy of Natural Sciences of Philadelphia and its entomological section and became a member of the American Entomological Society February 9, 1863. He will be greatly missed by his associates in the society.

Mr. Ridings leaves a wife and one daughter to mourn his loss. Services were held in All Saints P. E. Church and the interment was at Mount Peace Cemetery, April twenty-first.

PROF. WILLIS GRANT JOHNSON.

Mr. Johnson was born at New Albany, Ohio, in 1866, and after studying at the Ohio State University, took his B. S. and M. S. degrees at Cornell, specializing in economic entomology. Later he took advanced work in Leland Stanford University and served as instructor there. As instructor in the University of Illinois he conducted important investigations, continuing his work for the Laboratory of Natural History, and later was state entomologist of Maryland. After organizing the State Horticultural Department of Maryland and serving as its chief until 1900, he took up journalistic work as managing editor of the American Agriculturist. He then became associate editor of the New England Farmer and the Orange Judd Farmer, as well as the Agriculturist, and but a short time ago he was appointed one of the Board of Control of the New York State Experiment Station at Geneva. While living in New York City he was attacked by spinal meningitis and after some time of illness died in that place March 11, 1908. His body was returned to Ithaca and buried in Lake View.

Mr. Johnson was the author of several reports and bulletins as well as the Poultry Book, which was published in three volumes in 1903-4-5. While living in Palo Alto, California, he was married and is survived by his wife and several relatives

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted.—A large number of all species of *Plusiotis*, *Prionus californicus*, *Derobrachus geminatus*, *S. cessus*, *julianus*, *Dynastes granti*, *Tetracha carolina*, *Pasimachus mexicanus*, all species of Cincidelidae and all other big beetles (Coleoptera) for cash or exchange. Kindly communicate with J. Sever, 335 E. 49th Street, New York City.

The undersigned, with a view of making as complete a State list as possible, desires to communicate with anyone who has collected Michigan butterflies or made notes upon the same. All such are asked to write.—Dr. W. W. Newcomb, 347 Trumbull Ave., Detroit, Mich.

Coleoptera for Exchange.—Canadian Coleoptera in papers, in every family, for North American ones. List sent on demand. Also a large number of exotic Coleoptera.—J. A. Jean, C. S. V., Ville St-Louis, Montreal, Canada.

Indian Insects in all orders. Specimens of *P. mayo*, *Kal. albofasciata*, *Hestia cadelli*, etc., from Andaman Islands, and *T. imperialis*, *A. camadeva*, *Phylliums*, *Phasmids* and live cocoons from Darjeeling and Assam.—A. Meik, 4 Convent Road, Entally, Culcutta.

Lepidoptera.—I would like to correspond with those who expect to collect for cash in new and little known regions, South and West, during the coming season.—John L. Healy, 312 City Hall, Chicago, Ill.

Coleoptera.—Nine double boxes containing named beetles to exchange for perfect Japanese gold fish.—Aug. Schmidt, 845 E. Russell Street, Philadelphia, Pa.

For exchange.—Named Coleoptera, *Cat. relicta*, *bianca*, *phrynia* and *S. columbia*.—A. W. Andrews, 186 Lothrop Ave., Detroit, Mich.

I have for exchange fine *Parnassius apollo*, *delius*; *Arg. dia*, *adippe*, *amathusia*, *pales*; *Van. io*, *urticæ*; many Erebiæ; *Sat. hermione*, *circe*, *alliona*; *Lycæna bellargus*, etc. Wanted cocoons of *cynthia*, *promethia*, etc., pupæ of *ajax*, *turnus*, *troilus*, *cresphontes*, *myops*, *geminatus* and others.—J. W. H. Harrison, 181 Abingdon Rd., Middlesbro' England.

Noctuidæ wanted in exchange. Am especially in need of a good series of *Mamestra nimbosa* at present. Have only Noctuidae to offer.—F. H. Wolley Dod, Millarville, Alta, Canada.

Will purchase or exchange *Catocala* of Missouri for a copy of Hulst's Monograph on the genus *Catocala*.—Ernst Schwarz, 6310 Newstead Ave., St. Louis, Mo.

Exchange.—Nine double boxes named Coleoptera and a number of Entomological papers; would exchange for perfect Japanese gold fish.—Aug. Schmidt, 854 E. Russell St., Phila.

Wanted.—Bibl. of Econ. Ent., parts 1, 2, 3, 6, 8; Insect Life, vol. iv, Nos. 9-12, vol. v, Nos. 6-12, vol. vi, Nos. 6-12; Lintner's 3rd and 4th Reports. I have for exchange parts of Insect Life, Expt. Sta. Record, Buls. Bur. Ent., Biol. Surv., etc.—C. O. Houghton, Newark, Del.

Wanted.—Cerambycidæ, Cicindelidæ and other Coleoptera in exchange for same from this locality. Bound vol. i, Trans. Am. Ent. Soc., 1867-8, to exchange for Horn's Monograph of the Tenebrionidæ.—C. A. Frost, 40 Grant St., South Framingham, Mass.

We offer a large number of North American butterflies in exchange. Butterflies from the United States named gratis.—Entomological Dept., Acad. Nat. Sci., Logan Square, Philadelphia.

Will collect in almost any order of insects this season in exchange for Coleoptera from other localities.—R. J. Crew, 72 Sarah Street, Chester, E. Toronto, Canada.

Natural History reports issued in 1853, with the explorations and surveys for the first Pacific Railroad, will exchange for Lepidoptera —Geo. Rossiter, 52 Tiverton Ave., Toronto, Canada.

Lucanidae and Scarabaeidae purchased from all parts of N. America. Send price lists.--Dr. Garry de N. Hough, New Bedford, Mass.

Wanted in exchange or for cash during the coming season fertile eggs of the Apantesis group, especially such of the Southern and Western States.—M Rothke, 807 Harrison Ave., Scranton, Pa.

Pamphila sassacus.—I am particularly anxious to get by purchase or exchange eggs of this skipper, and should like to receive with the eggs the butterfly which laid them.—J. Fletcher, Exper. Farm, Ottawa, Can.

INSECTS OF NORTH CAROLINA

I am desirous of securing accurate data concerning occurrence of all species of insects in this State. Correspondence desired with parties or institutions having North Carolina material. Willing to pay for accurately prepared lists of any considerable number of species. Correspondence wanted with parties desiring material in certain groups from this State. Will gladly give suggestions to persons desiring to find suitable collecting grounds in this State for work at any season In short, want the varied and interesting entomology of this State to be known and recognized by entomologists, and willing to assist in every way to make it known and get it recorded. About 300 miles of coast line and numerous mountain ranges and peaks 5000 to 6700 feet elevation. touches of subtropical and boreal faunas and all intergradations In writing mention this advertisement

FRANKLIN SHERMAN, JR , Entomologist
State Department of Agriculture, Raleigh, North Carolina

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,
6, Gunterstone Road, West Kensington, London, W.
Cat No 17 for 1908 now ready mailed free on demand

The only dealers' list giving authors' names throughout 100 named specimens, equal ex Assam, 40 different species in papers, including *Papilio bootes, gyas*, etc., mailed free on receipt of Post Office Order $4.00 Explanatory Catalogue, with over 300 descriptions and many interesting notes 12 cents

PARCELS SENT ON APPROVAL FOR SELECTION.

FOR SALE. COMPLETE SET OF EDWARDS' BUTTERFLIES
Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

NATURHISTORISCHES INSTITUT "KOSMOS."

HERMAN ROLLE, BERLIN, W. 30, SPEYERER STR. 8.
Offers Catalogues as follows:

Catalogue of Exotic Lepidoptera	6c	Catalogue of Exotic Coleoptera	[illegible]
Catalogue of Palæarctic Lepidoptera	12c.	Supplement to the Catalogue of Exotic Coleoptera	[illegible]

All [illegible] are carefully arranged in systematical order following the best catalogues with [illegible] of authors, families, subfamilies, localities, synonyms, etc.

Best help for the arrangement of the collections.

FOR SALE

The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, .25; *. arizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. hornii*, .50; *Pasi-achus mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. arizo-icus*, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Monilema gigas*, .40; *Oncideres essellatus*, .75; *Leptostylus yuccæ*, 50.; *Urodera crucifera*, 20; *Nodonota arizonica*, .25. lso the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus epigona*, .50; *xycnemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia alata*, 40; *Spragueia plumbifimbriatus*, 25; *Hatima zethus*, .75; *Triprocris rata*, .30; *Gingla later-ula*, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North merican insects of all orders for sale, or exchange furnished on application.

F. H. SNOW - - - LAWRENCE, KANSAS

The Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

Cocoons of HYPERCHIRIA PAMINA Neum.

and Var. AUROSEA Neum.

ARIZONA. FOOD PLANT, OAK. PRICE, $1.

Otto Buchholz, 382 Littleton Ave., Newark, N. J.

New Arrivals from Mexico, South Brazil and Java

Lot of 100 perfect, correctly named, specimens from Java, with bright colored species of *Euploea*, *Hypolimnas*, *Hestia*, *Neorina*, *Cethosia*, *Junonia*, *Kallima inachis* or *paralecta*, *Charaxes*, *Ixias*, etc., and 15 *Papilio* (f. inst. *coon*, *aristolochiae*, *gigon*, *arjuna* var. *gedeensis*), several varieties of the female *memnon*, etc., for $7.50.

Lot of 100 perfect, correctly named, specimens from Brazil or Mexico, with 10 *Papilio*, $7.50.

SPECIAL—*Papilio pilumnus*, ♂, $1.50, ♀, $2.50; *asclepias*, ♂, $2.00, ♀, $4.00; *pharnaces*, ♂, $1.00, ♀, $1.50. *Morpho epistrophis*, ♂, 60c., ♀, $1.00. *Caligo martia*, ♂, 75c., ♀, $1.00. *Kallima inachis*, 40c.; *paralecta*, 60c. *Attacus atlas*, **very large**, ♂, 75c., ♀, $1.00.

O. FULDA, 816 BROADWAY, NEW YORK

When calling at my New York Store, mention NEWS to get special prices.

FOR SALE:—PSYCHE **Complete to end of Thirteenth Vol. (1906**
fine set, bound in morocco, with the excep
of last two volumes. Price $50. for the se

PHILIP LAURENT, 31 East Mt. Airy Avenue, Philadelphia, Pa.

The Butterflies of the West Coas

A new book. Text, descriptive and critical, of all known species, illustra with thirty-two full page plates in best modern photographic color work, w nearly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practical out of print; is not in any dealers' stock, and only a few copies now remain the author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAS

An abridgement of the above, consisting of the full set of plates as issued that book, with names of all species printed on pages facing the plates, with no descriptive text; issued as the best possible substitute for that expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either bo address the author.

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNI

WILLIAM J. GERHARD
SCIENTIFIC BOOKS

2209 CALLOWHILL STREET
PHILADELPHIA, PA., U. S. A.

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia. 6 vols. 1861-67. Co
Half morocco. Scarce . . . . $
—Same. A copy in original parts, lacking vol. ii, No. 3 . . . . $
Strecker, H. Lepidoptera Rhopaloceres and Heteroceres, etc. 15 parts
4 supplements. 4 to. 1872-1900. 15 colored plates. Scarce. . $
Say. Complete writings of Thomas Say on the Entomology of North A
Edited by J. L. LeConte. 2 vols. 1859. Cloth. 54 col. pls. $
Saussure, H. de. Etudes sur la famille des Vespides. I. Guepes solitaires
de la tribu des Eumeniens. 1852. 22 colored plates . . . . . . $
II. Guepes sociales ou de la tribu des Vespiens. 1853. 37 col. pls. $
III. Monographie des Masariens. 1856. Lacks plates. . . . . $
Muller, H. Befruchtung der Blumen durch Insekten. 1873. With, We
Beobachtungen, 3 parts. 1879-82. . . . . $

)URNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

or, E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec. Assn. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rogue, Louisiana

Advisory Board { L. O. Howard / S. A. Forbes — James Fletcher / H. A. Morgan — Herbert Osborn / H. T. Fernald

bi-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

rms of Subscription:—In the United States, Cuba and Mexico, two dollars annually in advance; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

IRNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

BUTTERFLIES AND MOTHS

'OR SALE, CHEAP—A collection consisting of nearly 3000 named cimens representing an excellent lot of interesting exotics, as well as a good es of North American species, both diurnals and nocturnals.

red. M. Mueller, 167 Evanston Ave., Chicago, Ill.

000 PIN-LABELS, TWENTY CENTS:

ed from the smallest type made. About 20 on a strip. No trimming—One cut makes a label. Send Money Orders ders good to be in multiples of 500 and no order will be filled for less than 500 each of 2 labels or 1,000 of one

. V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

EPIDOPTERA. I would like to correspond with those who expect to collect for h in new and little known regions, South and West, ring the coming season.

HN L. HEALY, 312 CITY HALL, CHICAGO, ILLINOIS.

OVA SCOTIAN LEPIDOPTERA.

Beautifully Mounted, in very fine condition, fully named and dated.

ecimens of 200 species, Catalogue value $65.00	$40 00
" 100 "	20 00
" 100 "	10.00
" European Lepidoptera, on pins	5.00

2500 specimens, Nova Scotian, to choose from. Expressage extra.

HN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER C

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YOR

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.
K.-S. Section Cabinets.
Schmitt Insect Boxes.
K.-S. Lepidoptera Boxes, Colo
and Duplicate Boxes
K.-S. Screw Handle and Asc
Nets.
The Asta Insect Pins:
White, 60c. per 1000.
Black, 70c. per 1000.

Catalogue H, Entomological Supplie
Application.

THE KNY-SCHEERER C

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPOSI
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect condition.
Single specimens and collections illustrating mimicry, protective colo
dimorphism, collections of representatives of the different orders of insects
Series of specimens illustrating insect life, color variation, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect box
Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

[illegible], Printer, [illegible] N. 7th Street, Philadelphia.

JUNE, 1908.

Library
JUN 11 1908

ENTOMOLOGICAL NEWS

Vol. XIX. No. 6.

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON. HENRY L. VIERECK. J. A. G. REHN.
PHILIP LAURENT. WILLIAM J. FOX. H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September**, in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.

Outside of the United States and Canada, $1.20.

SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

All remittances should be addressed to ENTOMOLOGICAL NEWS Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

YOUR ATTENTION

is called to the following list of

CHOICE LEPIDOPTERA AT REDUCED PRICES

Having a considerable number of desirable, perfect, papered specimens in stock, which must be disposed of to make room for new shipments to come, they are offered at the following prices:

Teinopalpus imperialis, female	[illegible]
Ornithoptera pompeus, male	[illegible]
" " female	.75
" *hephaestus*, female or male	[illegible]
" *helenoides*, male	[illegible]
" " female	[illegible]
Papilio blumei	[illegible]
" *androcles*	[illegible]
" *buddha*, male	[illegible]
" *maro*, male	[illegible]

Papilio chaldeus, male	[illegible]
Kallima inachis, male	[illegible]
" " female	[illegible]
Hestia cadelli, male	[illegible]
Antheraea roylei, male	[illegible]
" *yama-mai*	[illegible]
" *harperi*, male	[illegible]
" *assamensis*, male	[illegible]
Brahmaea japonica	[illegible]
Cricula trifenestrata, per pair	[illegible]

Send 12 cents additional with each order to cover postage and packing.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA.

ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in botany, especially cacti and herpetology—reptiles and amphibians if notified early in the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th St., New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSECTS

(EXCEPT ODONATA)

OF THE UNITED STATES

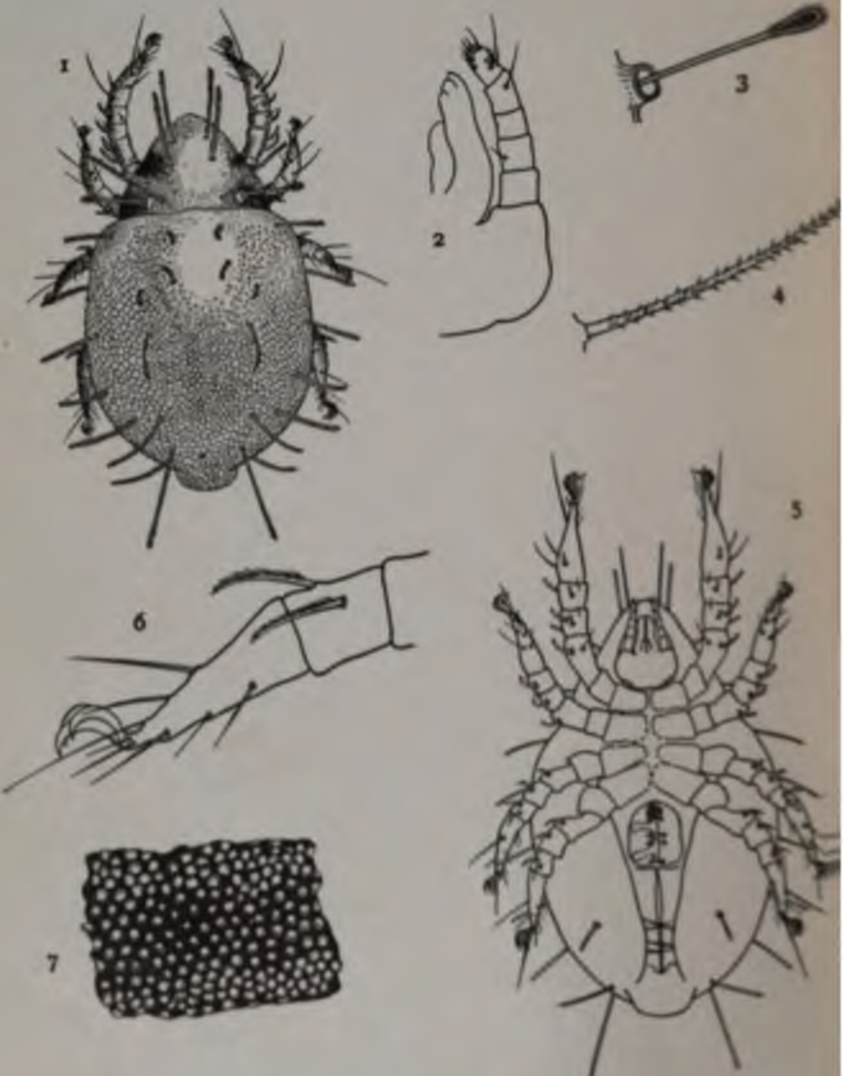
BY NATHAN BANKS

Complete to Summer of 1907 Price 50 cts. (net) per copy Mailed on receipt of price

Send for copy of New Additions to Price List; just issued.

E. T. CRESSON, Treas., P. O. Box 248, Philadelphia, Pa.

When Writing Please Mention "Entomological News."



ORIBATIDAE—EWING.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. JUNE, 1908. No. 6.

CONTENTS:

Ewing—A new genus and species of Oribatidae ... 243
Rohwer—Some Crabronidae from Colorado and New Mexico ... 245
Fernald—Notes on Erebus odoratus L. 260
Wilson—The green Aphis of the Chrysanthemum—Aphis rufo maculata n. sp. ... 261
Haimbach—New Pyralidae ... 263
Williamson—Three related American species of Aeshna (Odonata) ... 264
Tucker—Incidental studies of new species of Oscinis ... 272
Haseman—Notes on the Psychodidæ.. 274
Manee—Some Observations at Southern Pines, N. Carolina ... 286
Editorial ... 290
Entomological Literature ... 291
Notes and News ... 291

A New Genus and Species of Oribatidae.

By H. E. Ewing, Arcola, Ill.

(Plate XI.)

The new genus described in this paper is the second of this group peculiar to North America. The first genus described as peculiar to this country was *Gymnobates,* Banks; recently I have added to my collection two new species which belong to this genus. The genus *Tumidalvus* described in this paper is perhaps nearer to *Lohmannia* than to any other of the known genera.

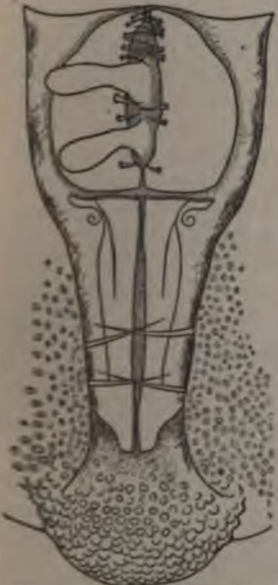


Fig. 1.—Median ventral region of abdomen, X 154.

TUMIDALVUS n. gen.

Pteromorphæ absent; cepthalothorax anchylosed with abdomen; mandibles chelate; lamellæ absent. Legs short and stout. There is no ventral plate to the abdomen. The dorsal plate extends down over much of the ventral part of the abdomen and touches both the anal and genital covers (Fig. 1). Anal and genital covers separated only by a rim common to both. Unguis tridactyle. The abdomen is oval and bears a large median boss or tubercle on the posterior end.

This genus resembles somewhat *Lohmannia* Michael, but differs from it in having three claws at the tip of the tarsus instead of one; in having the abdomen terminate posteriorly in a large swelling or tubercle; also in the shape of the abdomen, which is not cylindrical as in *Lohmannia,* but is oval, as in most Oribatidæ.

Tumidalvus americana n. sp.

Light brown; posterior part of the abdomen much darker than the rest of the body.

Cephalothorax almost as broad as long; no lamellæ. The cephalothorax bears three prominent pairs of large, stout, pectinate bristles (Pl. XI, Fig. 1); those of the anterior pair, situated near the tip of the rostrum, are about one-half as long as the cephalothorax and are directed forwards; at about the middle of the dorsal surface of the cephalothorax is situated a similar but slightly stouter pair of bristles, equal in length to the anterior pair; there is a much larger posterior pair of bristles situated almost approximate to the posterior margin of the cephalothorax, between the pseudostigmata; they are directed outwards and are about one third longer than the middle pair. The pseudostigmata (Fig. 3) are prominent, cylindrical in shape, and about one half as broad as the tibia of leg 1. The pseudostigmatic organ has a long, straight peduncle and a small clavate head; it is about two thirds as long as the posterior pair of bristles.

The abdomen is about three fifths as broad as long, the surface is covered with rather small, round tubercles of almost uniform size (Fig. 7); on the median posterior aspect of the abdomen there is a large swelling or tubercle, already mentioned as a generic character. The dorsum of the abdomen bears twelve pairs of stout, pectinate bristles (Fig. 4). There are two rows of six bristles each on the dorsum, one on each side of the median line and not far from the same; the bristles in these rows increase in size from the anterior pair backwards; the anterior pair is about one fifth as long as the posterior pair. There is a row of six subequal bristles on each side of the abdomen, on or slightly above the lateral margin. Genital and anal covers contiguous (Fig. 5), genital covers about two thirds as long as anal covers, and each bearing on its inner margin eight stout, short, sharp spines, which point inwards; anal covers very long and narrow, each bearing near its outer margin two prominent stout bristles which point inwards, each bristle is about twice as long as the width of the anal cover at the point where it is situated.

Legs stout and short, the anterior pair being about three-fifths as long as the abdomen; tarsus of leg 4, one and one-half times as long as the tibia; tibia almost as broad as long (Fig. 6); genual equal to the tibia in length, but slightly broader than the same. All the legs bear a few stout, curved, pectinate bristles, and the tarsi several simple bristles. Unguis tridactyle, dactyles equal.

Length 0.70 mm.; breadth 0.45 mm.

In moss. Collected by the writer at Arcola, Ill.

EXPLANATION OF PLATE.

Fig. 1. *Tumidalvus americana,* dorsal view, X 92.
Fig. 2. *Tumidalvus americana,* labial organs of the left side, X 202.
Fig. 3. *Tumidalvus americana,* pseudostigma and pseudostigmatic organ, X 202.
Fig. 4. *Tumidalvus americana,* seta from the abdomen, X 202.
Fig. 5. *Tumidalvus americana,* ventral view, X 95.
Fig. 6. *Tumidalvus americana,* tibia and tarsus of leg, IV, X 202.
Fig. 7. *Tumidalvus americana,* piece of integument from dorsum of abdomen, X 210.

◆

Some Crabronidae from Colorado and New Mexico.

By S. A. Rohwer, Boulder, Colo.

CRABRO (Protothyreopus) DILECTUS Cress. ♀ Florissant, Colo., July 7, 1907 (S. A. Rohwer); the markings are yellow, not whitish, scutellum black, post-scutellum yellow, spots on third abdominal segment meeting. ♂ Florissant, Colo., July 12, 1906 (S. A. Rohwer) fls. *Geranium*; the markings are yellow, those on the abdomen somewhat whitish. ♂ Beulah, N. M., Aug. (Ckll.); does not quite agree, the spots on the first abdominal segment meet, two small spots on each side of posterior face, markings dark yellow. Perhaps *dilectus* is merely a variation of *bigeminus* Patt.

CRABRO (Protothyreopus) RUFIFEMUR Pack. ♀ Cripple Creek, Colo., July 31, 1906, about 9100 ft., fls. *Potentilla* (S. A. Rohwer). New to Colorado.

CRABRO (Thyreopus) VINCUS Cress. ♀ Cripple Creek, Colo., July 31, 1906, about 9100 ft., fls. *Pentstemon* (Roh.); ♀ Copeland Park, Boulder Co., Colo., about 8500 ft., Sept. 6, 1907 (G. M. Hite); ♀ Boulder, Colo., Sept., 1906 (G. M. Hite); ♀ Florissant, Colo., July 18, 1906 (Ckll.); ♀ Boulder, Colo., June (G. M. Hite) is 8 mm. The Cripple Creek specimen has the bands on the abdomen wider and darker yellow The pubescence is black.

Crabro (Thyreopus) latipes Sm. 6 ♂♂ Florissant, Colo. June and July, 1907, on foliage of *Ribes vallicola* (Roh.); 4 ♂♂ Florissant, Colo., July, 1906 "flying around *Ribes*." (Ckll.); 2 ♂♂ Florissant, Colo., July 7, 1907, on foliage of *Salix brachycarpa* (Roh.); 4 ♂♂ Boulder, Colo., Sept 4. 1906, on foliage of *Vitis vinifera*, (Roh.); ♂ Boulder, Colo. June (G. M. Hite); ♂ Copeland Park, Boulder Co., Colo. Sept. 6, 1907 (Roh.). The last does not seem to be the same. but I can find no good characters on which to separate it. All of them have black hair on thorax above and vertex, pale hair on the front, white on mesopectus. The abdomen is elongate as in *Coloradensis* Pack., which is considered a synonym of *latipes*. The strength of the metathoracic ridges varies somewhat, also the keel on the cheeks.

Crabro (Synothyreopus) conspicuus Cress. Boulder, Colo. May 18 (G. M. Hite), Aug. 30, 1906 (Roh.).

Crabro (Blepharipus) nigricornis Prov. ♀ Copeland Park. Boulder Co., Colo., Sept. 4, 1907, alt. about 8500 ft. (Roh) New to Colorado.

Crabro (Blepharipus) ater Cress. Florissant, Colo., July 7 1907, fls. *Heracleum lanatum*, (Roh.).

Crabro errans Fox. ♂ Jim Creek, Boulder Co., Colo., Sept 7, 1907, fls. *Eriogonum effusum* (Roh.); Florissant, Colo July 21, 1906, on *Cleome serrulata*, also July 10, 1906 (Ckll.). ♂ Las Vegas, N. M., June 7 (Ckll.).

Crabro (Cuphopterus) conferitus Fox. ♀ Copeland Park Park, Boulder Co., Colo., Sept. 6 1907, (Roh.); ♂ Florissant Colo., July 18, 1906 (Ckll.) The male has a good deal of white pubescence on the head and thorax.

Crabro (Solenius) bellus Cress. ♀ Boulder, Colo., June 11 (G. M. Hite); ♀ Florissant, Colo., July 28, 1907, fls. *Carduus acaulescens*, also July 21, 1907, fls. *Geranium richardsoni* (Roh.).

Crabro (Xestocrabro) sexmaculatus Say. Las Vegas, N M., Aug. 3, 1907 on foliage of *Veratrum* (Ckll.).

Crabro (Xestocrabro) trifasciatus Say. ♀ Cripple Creek

Colo., July 17, 1906, fls. *Linum lewisii* (Roh.); 2 ♀ ♀ Florissant, Colo., July 21, 1907, fls. *Geranium richardsonii* (Roh.); 3 ♂ ♂ Florissant, Colo., July 7, 1907, fls. *Heracleum lanatum*, (Roh.); ♀ Beulah, N. M. (W. P. Cockerell).

Crabro (*Cuphopterus* Moraw.) **operus** n. sp.

♀. Length about 7 mm. Clypeus with the usual medial carina, the anterior margin with four distinct, rather sharp teeth; ocelli in a triangle, the distance between the lateral ones about equal to the distance from them to the nearest eye margin; first joint of flagellum a little longer than the second; usual frontal depression above antennæ; a line-like furrow from frontal depression to lower ocellus; a more indistinct one from lower ocellus to vertex; head finely and densely punctured, more sparsely on occiput and cheeks; face sub-opaque, cheeks shining; pronotum with a rather strong anterior ridge, dentate laterally; dorsulum with very fine longitudinal striæ on posterior part, and sub-transverse striæ on anterior part; among these striæ are punctures and at first sight the dorsulum looks finely punctured; a medial ridge for nearly the entire length of dorsulum; scutellum with large sparse punctures; mesopleuræ rather finely striate; enclosure of metathorax obliquely striate, a distinct longitudinal furrow down the middle; this furrow broadens somewhat on posterior face and forms a fovea; posterior face of metathorax with some transverse striæ, stronger below; sides of metathorax finely striated; lateral ridges distinct; ridge between upper and posterior face not as strong as lateral ridges, more or less indistinct; a transverse furrow on basal half of some of the abdominal segments above; abdomen indistinctly punctured above; second ventral segment with a few large, shallow punctures; pygidium narrowed apically as in the *sexmaculatus* group, rather acute at apex; four posterior tibiæ serrate beneath; all the femora robust; tarsi single; first recurrent nervure in apical third of cell. Color black; spot on mandibles, scape behind, tubercles, spot on all the tibiæ beneath, a small elongate spot on sides of abdominal segments 2-5 *yellow;* tarsi, more especially the anterior pair, and tegulæ reddish; clypeus and lower inner orbits with silvery pubescence; sides of pygidium with long gray hairs; rest of insect without hair. Wings subhyaline, nervures and stigma dark brown.

Habitat—Beulah, N. M. (W. P. Cockerell). Two females.

The striation of the dorsulum seems to run this species into Fox's group *singularis,* but it is certainly not any species in that group. Disregarding the striation of the pronotum, it runs to *paucimaculatus* Pack., from which it may be separated by the pronotum being dentate laterally, having no yellow on the metanotum, etc. While in Ashmead's table it runs to *Cuphopterus* Moraw., it does not seem to be closely related to any of the species of that group.

Crabro opwana * n. sp.

♂. Length 7-9 mm. Clypeus rounded on the anterior margin, slightly emarginate in the middle, middle carina not very strong but still plainly seen; front between eyes from a little above the middle of eyes smooth, shining; near the eyes there are a few striæ, rest of head with large, distinct, well separated punctures, ocelli in a triangle; scape wider at apex than at base; flagellum stout, first and second joints equal, smooth, without a fringe of hairs; pronotum rather longer than usual, a distinct, slender, sharp tooth at anterior corner; (this tooth is stronger in some specimens than others); dorsulum, scutellum with large distinct punctures; mesopleuræ strongly strio-punctate; mesopectus rather finely punctured, episternum and epimeron of metathorax distinctly striated with strong striæ; metathorax without an enclosure, dorsulum and posterior face strongly punctured, the dorsulum more strongly; first joint of hind tarsi distinctly longer than the longest spur of hind tibiæ, anterior femora produced beneath for the entire length, near the base is a sharp tooth; (in some specimens there is another much smaller tooth near the apex); middle femora produced beneath so that when viewed from behind each is somewhat rectangular; posterior femora normal; posterior tibiæ serrated on the outer margin, middle tibiæ not serrated, without spur at apex; first recurrent nervure in [illegible] sixth of cell; abdomen strongly constricted between the first and second segment, and less so between segment two and three, and sometimes three and four; basal segments with distinct, well separated punctures, apical segment very finely punctured, venter with some well separated punctures. Color black, scape except a spot behind, tubercles, sometimes two spots on pronotum, spots on first six abdominal segments above, (these spots meet on segments five and six, forming a band), apex of anterior and middle femora (the yellow on the anterior femora is wider beneath) legs below femora except a black spot on four posterior femora within, yellow; hind tarsi somewhat infuscated; antennæ beneath somewhat testaceous but not strongly so. Wings dusky hyaline, apical half a little the darker; nervures and stigma dark brown (the stigma in one specimen is pale brown.) Clypeus, lower half of inner orbits, lower part of cheeks, sides of thorax and pectus with silvery pubescence

---

* Opwaan is the Chippewa (Indian) word for thigh. Used here on account of the [illegible] on the fore femora.

Habitat—Eight ♂♂ Florissant, Colo., July 7, 1907, 8000 ft., fls. *Heracleum lanatum,* (S. A. Rohwer).

In Fox's table (Crabroninæ of Boreal North America) this species runs to between *hilaris* Sm. and *cognatus* Fox., but is neither of these and not any of the species of the *hilaris* group, being easily separated by having the antennæ entirely without hair and other characters. Easily separated from *C. snowii* Fox which falls in the same place by the naked antennæ. Following Dr. Ashmead's arrangement (Can. Ent.) this species would probably form a new genus near *Paranthyreus* Kohl being separated from it by the absence of a spur on the middle tibiæ.

Crabro (*Protothyreopus* Ashm.) **megacephalus** n. sp.

♀. Length about 13 mm.; width of head 3 mm.; width of thorax 2½ mm,; length of anterior wing 9 mm. Head wider than thorax, large; closely, evenly and rather finely punctured throughout; line from lower ocellus rather faint; ocelli in a low triangle, the distance between the two hind ocelli slightly less than the distance between them and the nearest eye margin; clypeus rounded anteriorly, middle carina not strong, without lateral teeth; distance between the eyes at the clypeus about the same as the width of the clypeus in the middle; first joint of flagellum about as long as 2 and 3, flagellum somewhat clavate, covered with microscopic pile; pronotum strongly ridged anteriorly, dentate laterally, the anterior face longitudinally striated; dorsulum and scutellum densely and finely punctured, almost matted; tegulæ with some very fine punctures; meso-pleuræ distinctly, transversely striate above, striato-punctate below, meso-pectus punctured; dorsulum of metathorax obliquely striate from middle; posterior face and side very finely transversely striated; middle furrow of metathorax not strong; slightly foveolate on posterior face; first recurrent received near apex of first cubital; femora robust, somewhat triangular (more especially the fore femora); anterior tarsi slightly flattened; middle and posterior tibiæ serrated on outer margin; abdomen above finely, densely punctured; ventral segments without large punctures, but with a number of small ones; pygidium broad, triangular, with large elongate punctures; sides of pygidium with a more or less distinct fringe of white hairs. Color black; mandibles except apex, scape entirely, two spots of pronotum, tubercles, spot below tegulae, two small lateral spots before the scutellum, postscutellum, apex of femora and legs below (middle and posterior femora have the yellow extending inward), two large spots on dorsal abdominal segments one and two, and a wide band on segment 3, 4 and 5 *deep yellow;* tegulæ part yellow and part testaceous; wings hyaline, the apical margin slightly dusky; nervures, costa and stigma pale brown to testaceous; clypeus, lower inner orbits, lower part of cheeks, fore femora above thorax (more strongly so on pectus and posterior face of metathorax), sides of three apical abdominal segments with silvery pubescence.

Habitat—Florissant, Colorado, July 6, 1906 (S. A. Rohwer)

The following table will separate this species from all its allies. It is more closely related to *rufifemur* Pack., but quite distinct. The table is based on the females of the subgenus *Protothyrepus* (Fox's group rufifemur).

Head and thorax with long, dense hair; ventral segments of abdomen 2-5 spotted with yellow (Calif.) . . . . **villosus** Fox

Head and thorax without such hair; venter of abdomen immaculate. 1

1. Posterior face of metathorax with two yellow spots (Atlantic coast generally . . . . **bigeminus** Patt

Posterior face of metathorax immaculate, black. . . 2

2. Pygidium strongly margined by a wall, slightly but distinctly depressed apically; head not larger than usual (Colorado, S. Dakota, Montana, Washington) . . . . **dilectus** Cress.

Pygidium not thus margined and not depressed apically; head large 3

3. Mesopleuræ striato-punctate throughout; enclosure of metathorax striato-punctate, posterior face distinctly transversely striate; punctures of scutellum sparse; punctures of first abdominal segment large and distinctly separated; second ventral segment with large well-scattered punctures, no yellow beneath tegulæ; two elongate yellow spots on third abdominal segment; legs partly rufous; fore femora without or with very little white pubescence above (U. S. east of Rocky Mts. and north of a line from Nebraska to Maryland **rufifemur** Pack

Mesopleuræ distinctly striate above; enclosure of metathorax finely obliquely striated, posterior face very finely transversely striate; punctures of scutellum dense, punctures of first abdominal segment finer and denser; second ventral segment without large punctures; a large yellow spot below tegulæ, third abdominal segment with a broad band, femora without rufous fore femora above with white pubescence (Colo.)

megacephalus Roh.

Crabro (*Solenius* Lept ?) **ferrugineipes** n. sp.

♂. Length 10 mm, length of anterior wing 8 mm. Head not as wide as thorax, closely, finely punctured (punctures densest between the eyes, ocelli in a low triangle; each ocellus in a depression, distance between the two lateral ocelli distinctly less than the distance between them and the nearest eye margin; no furrow from middle ocellus; clypeus without lateral teeth, rather strongly rounded in the middle; middle carina not strong; first four joints of flagellum emarginate beneath, the apex of the fourth joint slightly produced at the apex beneath, first joint a little longer than second; pronotum rather strongly ridged anteriorly, a stout, sharp tooth laterally; dorsulum and scutellum with large separated punctures; meso-pleura transversely striate above striato-punctate lower down; meso-pectus punctured; dorsulum of metathorax punctured; sides and posterior face of metathorax transversely striate (the striæ of posterior face larger); middle furrow distinct, strongly foveolate on posterior face; upper and posterior faces separated by a circular furrow; fore tarsi very slightly flattened; first two abdominal segments constricted at base; first two dorsal segments distinctly punctured, punctures large and well separated; the following segments are more finely and more densely punctured; venter smooth, shining; genitalia with a comb of long hair beneath. Color black; mandibles within, scape entirely, two spots on pronotum, tubercles, postscutellum, small elongate spots on sides of second abdominal segment, broad band on dorsal segments 3-6 *deep yellow;* tegulæ mostly ferruginous; legs below trochanters, ferruginous (posterior tibiæ and tarsi are somewhat yellowish); wings dusky hyaline, nervures pale brown, costa and stigma testaceous. Clypeus, lower, inner and posterior orbits with silvery pubescence; head, thorax first dorsal ventral abdominal segment with long black hair; last five dorsal segments with short black hair.

Habitat—Pecos, N. M., July 16, 1903 (W. P. Cockerell).

In Fox's table (Crabroninæ of North Am.) this species runs near *texanus* Cress., but the punctures on the head are not large and well separated, the legs are differently colored, 3-6 abdominal segments banded etc. It has much general resemblance to *spiniferus* Fox, but the punctures on the dorsulum are even throughout, the abdomen more closely punctured, size larger, the legs below the coxæ are ferruginous, etc. The fore tarsi are very slightly flattened and in some respect it is like *rufifemur* Pack., but is very different.

Crabro (subgen. ?) **nokomis** n. sp.

♀. Length 12 mm.; length of anterior wing 9 mm.; width of head 3 mm.; width of thorax 3 mm. Head large, as wide as thorax, closely, finely punctured; ocelli in a low triangle; distance between the two lateral ocelli less than the distance between them and the nearest eye margin; in front of each ocellus in a small depressed area;

no furrow from middle ocellus; clypeus produced in middle into a truncated process, the width of which is equal to the distance between the eyes at the clypeus; middle carina strong; mandibles bifid at apex, with three inner teeth, the first tooth small; first joint of flagellum equal to 2 and 3; pronotum not strongly ridged anteriorly, but feebly so, not dentate laterally, anterior face smooth, when seen from in front there is a U-shaped fovea at the top in the middle; dorsulum finely densely punctured posteriorly, finely striato-punctate posteriorly; scutellum punctured anteriorly, longitudinally striated posteriorly; meso-pleuræ strongly transversely striated; mesopectus smooth with large scattered punctures; dorsulum of metathorax finely obliquely striated from center; sides and posterior face of metathorax *finely* transversely striated; middle furrow strong, distinctly foveolate on posterior face; femora stout, triangular in cross-section; anterior femora with a strong keel on inner posterior margin, outer margin of middle and posterior tibiæ with a number of stout spines; dorsulum of abdomen densely finely punctured, the punctures on the first segment larger and more separated; venter of abdomen microscopically punctured; apical margin of each segment with a row of large punctures; pygidium strongly margined, strongly depressed and narrowed apically; sides of pygidium with a fringe of testaceous hair. Color black; elongate spot on mandibles, scape entirely, two spots on pronotum, tubercles, apex of femora, tibiæ except a black spot within on the anterior four (tarsi dull testaceous), elongate spots on sides of first three abdominal segments above (those on the third largest and almost meeting, those on the first small and well separated), broad band fourth and fifth segments above *yellow;* tegulæ rufous; wings dusky hyaline; nervures, costa and stigma pale brown. Middle of clypeus with golden pubescence, sides of clypeus, lower inner orbits, posterior orbits, lower part of [illegible] with silvery pubescence.

Habitat—Florissant, Colo., June 26, 1907 (S. A. Rohwer).

In Fox's table (Crabroninæ of N. Amer.) this species runs near *montanus* Cress., but it may be known from all of that group by the different sculpture, larger size, fringe at side of pygidium, etc. Disregarding the structure of the clypeus it runs to *trifasciatus*, but is at once known from this by the ocelli being in a lower triangle.

Crabro (*Thyreopus*) **brachycarpae** n. sp.

♂ Length 7 mm; length of anterior wing 5 mm. Head about as wide as thorax, finely densely punctured, cheeks without tooth or keel; ocelli in about an equilateral triangle, the distance between the two lateral ones slightly less than the distance between them and the nearest eye margin; a distinct line-like furrow above and below middle ocellus; facial basin smooth, shining; clypeus rounded anteriorly, slightly notched in middle, without teeth; no middle carina on clypeus; distance between the eyes at the clypeus about equal to width of clypeus in the middle; antennæ simple, flagellum (excluding pedicellum) a little more than twice as long as scape, first joint of flagellum a little longer than second; pronotum not ridged anteriorly, a small blunt tooth laterally, on anterior face finely punctured; dorsulum finely densely punctured; on the anterior portion there are some large punctures with many fine ones in between; meso-pleuræ very finely striato-punctate; no furrow between the epimeron mesopleuralis and mesosternum, but there is a small circular fovea in about middle; scutellum with irregular large punctures; dorsulum of metathorax with distinct longitudinal striæ, the striæ well separated; sides and posterior face irregularly transversely striate; middle furrow distinct, on posterior face triangularly foveolate; first recurrent nervure nearer the middle than apex of cell; anterior trochanters triangular, not quite half as long as their femora; tibial shields a little longer than broad, anterior and posterior angle rounded; medial tarsi very slightly flattened, the first joint equal to the following joints united; abdomen shining, apparently not sculptured. Color black, including mandibles; scape except a spot at base within, clypeus more or less, large spots on pronotum, tubercles, scutellum entirely, postscutellum, apex of anterior four femora, tibiæ except spot within on middle, a spot on inner and outer apical margins of posterior, tarsi (apical joints infuscated), band on all the dorsal abdominal segments (band on second and third slightly broken in middle), small spot on second and third ventral segments, *greenish-white;* tegulæ black; wings hyaline but not clearly so; nervures testaceous; thorax and head with long, rather sparse, white hair; clypeus and narrow, lower inner orbits with silvery pubescence; shield cream-colored, the apical two-thirds streaked with black.

Habitat—Florissant, Colo., June 23, 1907, on *Salix brachycarpa* (S. A. Rohwer).

Closely related to *C. vernalis* Pack., but easily known by the color of the shield, the presence of a circular fovea on mesopleuræ, the shorter first joint of flagellum, and other characters.

Crabro (*Xestocrabro* Ashm.) **heraclei** n. sp.

♂. Length about 8½ mm.; length of anterior wing 5 mm. Head about the same width as thorax, closely, finely punctured, occiput finely striato-punctate; ocelli in a rather low triangle; furrow from lower ocellus faint; distance between hind ocelli less than that to the nearest eye margin; facial basin distinctly margined above, smooth, shining; first joint of flagellum a little longer than second, first and fourth emarginate basally, second and third slightly produced in middle beneath; clypeus rounded anteriorly, slightly produced in middle, without lateral teeth; middle carina well developed; pronotum produced anteriorly, notched in middle, a strong sharp spine laterally, a faint transverse carina near apical margin; dorsulum rather coarsely striato-punctate, striæ more distinct posteriorly, two distinct longitudinal carina; scutellum striato-punctate or striated; meso-pleura transversely striated above, punctured below, meso-pectus shining, finely punctured; suture between episternum and epimeron meso-pleuralis strong; upper surface of metathorax divided by a margined furrow, the walls of which separate the upper and posterior faces by turning at right angles with the furrow; upper surface with a few oblique striæ, also some punctures; furrow abruptly ending below middle of posterior face; posterior face with three more or less distinct transverse striæ, rest apparently finely punctured; sides of metathorax finely, closely, transversely striated; all femora without teeth; middle tibiæ without apical spur; middle and posterior tibiæ with a few teeth on outer margin; abdomen shining, very finely punctured, venter without punctures; apical segment sharp at apex, with a fringe of hairs. Color black; spot on apex of scape in front, two elongate spots on pronotum, two small spots before scutellum, postscutellum, rather large spot on dorsal segments 1-4, band on dorsal segments five and six, *greenish-yellow;* legs black, line on posterior side of anterior femora and a spot on apical anterior side, spot on apex of middle femora, anterior four tibiæ beneath, spot on posterior tibiæ beneath, anterior tarsi, *greenish-yellow;* tegulæ rufous; wings dusky hyaline, nervures and stigma dark brown; clypeus with silvery pubescence; meso-pleuræ with white hair.

Var. with the sculpture of dorsulum weaker, meso-pleuræ more striato-punctate, ridges of metathorax not so prominent, tubercles yellow.

Habitat—Florissant, Colo., July 7, 1907 (S. A. Rohwer), fls. *Heracleum lanatum*. Var. Florissant, Colo., June 30, 1907 (S. A. Rohwer), on foliage of *Salix brachycarpa*.

This species may be separated from all others of the subgenus *Xestocrabro* by the strongly spined pronotum. In the somewhat striated effect of the dorsulum it resembles *singularis* (= *maculatus*) but there is no spine on the anterior femora. Closest to *foxii* Kinc., but the structure of the metathorax is different and the scape is partly yellowish, etc.

Crabro (*Xestocrabro*) **drymocallidis** n. sp.

♂. Length 5½ mm.; length of anterior wing 4 mm. Head finely rather sparsely punctured; ocelli in about an equilateral triangle; distance between hind ocelli less than that between them and the nearest eye margin; a furrow from lower ocellus to facial basin; facial basin smooth, shining, not meeting eyes on sides, rather obtusely pointed above; first joint of flagellum longer than second, first three joints emarginate basally, produced at apex, apex of fourth joint slightly produced beneath; clypeus rounded anteriorly, without teeth; middle carina not strong; pronotum sharply truncate anteriorly, without ridge or teeth; slightly notched in middle; dorsulum more densely punctured than head, without longitudinal carina; scutellum striato-punctate; meso-pleuræ finely, transversely striated, some striæ stronger than others; suture between episternum and epimeron meso-pleuralis quite distinct; furrow of middle segment distinct; upper and posterior faces divided by a ridge; upper surface shining, with a few oblique striæ; sides and posterior face transversely striated; anterior femora produced at base beneath; middle tibiæ without apical spur; abdomen smooth, shining, impunctate, widest beyond middle. Color black; small spot on apical part of scape beneath, tubercles, small spots on sides of second, third and fourth dorsal abdominal segments *bright-yellow;* legs black, anterior femora beneath *rufous,* anterior tibiæ beneath, anterior tarsi, spot on apical part of middle femora beneath, spot on posterior tibiæ beneath *yellow* or rufous; wings dusky hyaline; nervures and stigma dark brown; clypeus, cheeks and lower part of thorax with silvery pubescence.

Habitat—Topaz, Butte, Teller Co., Colo., alt. about 9000 ft., June 23, 1907 (S. A. Rohwer), fls. *Drymocallis fissa.*

May be separated from its allies by anterior femora produced beneath, smaller size, darker color, etc.

Crabro (*Crossoceros*) **cockerelli** n. sp.

♀. Length about 4½ mm.; length of anterior wing 3½ mm. Head as wide as thorax, shining, impunctate or very finely punctured; ocelli in an equilateral triangle; the distance between the two hind ocelli about equal to the distance to the nearest eye margin; a distinct furrow from the anterior ocellus to occiput; furrow from anterior ocellus to near the base of antennæ not so strong as upper furrow, sides more sloping; facial basin not distinctly defined; antennæ slender, not at all clavate; first joint of flagellum a little longer than second; flagellum beneath with a row of very fine, rather short hairs; clypeus rounded on outer margin, without teeth or middle prominence; middle carina not distinct; pronotum with a low, rounded, indistinct ridge anteriorly, without teeth laterally, slightly notched in middle, smooth, shining; dorsulum smooth, shining, with a few very small punctures, a more or less distinct longitudinal furrow at middle; meso-pleuræ smooth, shining, impunctate, suture rather strong; upper surface of metathorax with some short, longitudinal striæ at base, furrow not strong, convexities shining, very finely striated; upper and lower surface separated by a furrow; posterior face on metathorax with a triangular fovea at basal middle, bounded by ridges at the sides, finely transversely striated; meta-pleuræ finely transversely striated; legs normal, middle tibiæ without spur; first transverse cubital received before middle of radial cell; abdomen smooth, shining, impunctate; pygidium broad, obtusely rounded at apex. Color shining black; spot on scape in front, line on pronotum, tubercles, scutellum *dark yellow;* legs—anterior trochanters and femora except a black line *reddish yellow;* anterior tibiæ and tarsi, except a line behind, middle femora except a broad line behind and a narrow one in front, middle tibiæ except a line behind, middle tarsi, base of posterior tibiæ and a line beneath *yellow;* clypeus and thorax beneath with white pubescence; wings hyaline, slightly dusky at apex, irridescent; nervures and stigma dark brown.

♂. Very much like ♀. Furrow on front stronger, metathorax furrow stronger, scape and tubercles black.

Habitat—Florissant, Colorado, July 17, 1906 (Ckll.) ♂ and ♀ "flying around *Ribes;*" 2 ♂ ♂ July 19, 1906 (Ckll.).

The ♀ runs near *lentus* Fox in Fox's table (Crabronidæ of N. Amer.) but differs as follows: clypeus without medial tooth. antennæ more slender; metathorax somewhat different; tubercles yellow; posterior tibiæ entirely yellow beneath, etc. May be known at once from *harrisii* Pack. by the dark venation. The ♂ runs to *impressifrons* Sm. but is not that species.

Crabro ([illegible]) **oriegoni** n. sp.

♀. Length about 5 mm., length of anterior wing 4 mm. Head as wide as thorax, densely finely punctured; broad, smooth, low furrow from lateral ocelli to upper orbits, ocelli in an equilateral triangle, distance between hind ocelli a little greater than that to the nearest eye margin, furrow from anterior ocellus to facial basin, facial basin smooth shining, antennæ slender, very slightly subclavate, first and second joints of flagellum subequal, clypeus rounded anteriorly, without teeth, middle carina wanting or almost so, pronotum very slightly ridged anteriorly, dorsulum finely densely punctured, meso-pleuræ finely [illegible] punctate, suture rather weak, in basal middle is a large puncture, scutellum similar to dorsulum in sculpture, furrow of metathorax rather faint on upper surface, more distinct on posterior face; convexities finely, longitudinally striated; middle furrow triangularly foveolate on posterior face above; posterior face and sides striato-punctate; striæ stronger; middle tibiæ with apical spur; femora rather more robust than usual; transverse cubitus received a little before middle of radial cell; abdomen shining, impunctate, pygidium triangular, rather sharp at apex, but not excavated, with a few large punctures. Color black; scape in front, mandibles except apex, tubercles, tips of anterior femora, anterior tibiæ, middle tibiæ except a black spot, base of posterior tibiæ, basal joint of middle and posterior tarsi *yellowish;* anterior tarsi ferruginous; clypeus, cheeks, thorax at sides and beneath with silvery pubescence, wings clear hyaline, iridescent; nervures and stigma dark brown.

Habitat—Jim Creek, Boulder Co., Colo., Sept. 7, 1907 (S. A. Rohwer), fls. *Eriogonum effusum,* Transition Zone.

Accompanied at flower by *Crabro errans* Fox, *Prosopsis* spp., *Odynerus* spp.

In Fox's table runs between *propinquus* Fox (Texas) and *minimus* Pack. (Eastern States) but there is no median prominence on the clypeus, and it differs in other characters.

Rhopalum modestum n. sp.

♂. Length 5½ mm.; anterior wing 4 mm. Head smooth, shining, impunctate; around each lateral ocelli is a depressed area; front slightly broken in middle by a line; facial basin rather narrow, shining; antennæ rather slender, pedicellum with tooth beneath, first flagellular joint emarginate, second produced beneath, remaining simple, pale at base; clypeus strongly produced medially, sides of this projection with small teeth, in middle there is a rounded tooth; pronotum rounded; dorsulum with very fine punctures; meso-pleuræ almost impunctate, suture almost wanting; suture of metathorax strong; metathorax shining; ridge on sides of posterior face; posterior four trochanters elongate; femora robust, especially the anterior pair; posterior tibiæ enlarged at apex; venation normal for genus; abdomen as usual in this genus. Color shining black; clypeus somewhat and antennæ piceous; scape beneath, tubercles, apical half of coxæ, trochanters, apex of four anterior femora, their tibiæ except a black spot within, anterior four tarsi, base of posterior tibiæ *yellow;* tegulæ, apex of posterior tibiæ, apex of abdomen *brownish-red;* clypeus and lower inner orbits with silvery pubescence; wings clear hyaline; iridescent; nervures dark brown.

Habitat—Boulder, Colo., May 30, 1906 (T. D. A. Cockerell).

Rhopalum Kby.—group *pedicellatus* Fox. This agrees exactly with this genus. The following table will separate the American species of this genus in the male sex.

Metathorax with an enclosure . . . . **pedicellatum** Pack.
Metathorax without an enclosure 1
1. Abdomen banded with reddish, anterior four legs entirely yellow; basal joint of middle tarsi simple . . . . . . **rufogaster** Pack.
Abdomen black; anterior four legs more or less black; basal joint of middle tarsi with a spine within . . . . **modestum** Roh.

The following table will separate all the species mentioned above:

Females 1
Males 16
1. Pygidium broad, flat, not strongly excavated towards apex . 2
Pygidium narrow, strongly excavated 10
2. Small species; abdomen entirely black 3
Large or medium size species; abdomen marked with yellow . . 5
3. Ocelli in a low triangle . . . . **errans** Fox
Ocelli in an equilateral triangle 4
4. Shining; scutellum yellow; fore trochanters and femora reddish. **cockerelli** Roh.
Subopaque; scutellum black; fore trochanters and femora black. **eriogoni** Roh.
5. Ocelli in an equilateral triangle; head and dorsulum finely punctured; mesopleurae shining, with a few punctures . . **confertus** Fox
Ocelli in a low triangle 6
6. Mesopleurae shining; with few punctures 7
Mesopleurae subopaque, striato-punctate or striated 8
7. Stigma and costa dark brown; ocelli (dry) deep black; metathorax more strongly sculptured . . . . **conspicuus** Cress.
Stigma and costa ferruginous; ocelli (dry) yellowish; metathorax not so coarsely punctured . . . . **viscosus** Cress.
8. Pygidium strongly margined by a wall, slightly but distinctly depressed apically; head not larger than usual **dilectus** Cress.
Pygidium not thus margined, not depressed apically; head large 9
9. Enclosure of metathorax striato-punctate; legs partly rufous **rufifemur** Pack.
Enclosure of metathorax obliquely striated; legs yellow and black **megacephalus** Roh.
10. Ocelli in an equilateral triangle; shining black . . . **nigricornis** Prov.
Ocelli in a low triangle 11
11. Clypeus produced into a truncated process 12
Clypeus rounded anteriorly, not produced into a truncate process 13
12. Head densely, finely punctured; clypeus with some golden pubescence . . . . **nokomis** Roh.
Head with large punctures; pubescence of clypeus silvery **bellus** Cress.
13. Posterior face with strong lateral ridges; abdomen with small yellow spots; slender head, thorax and abdomen nude **asperus** Roh.
Posterior face of metathorax without strong lateral ridges . 14

14. Dorsulum very closely punctured; upper and posterior faces of metathorax indistinctly separated . . . . **trifasciatus** Say.
Dorsulum not so closely punctured; upper and posterior faces of metathorax not separated . . . . **6-maculatus** Say.
15. Abdomen petiolate, petiole clavate; coxae and trochanters yellow. **modestum** Roh.
Abdomen not petiolate . . . . 16.
16. Anterior tibiae with a large shield . . . . 17.
Anterior tibiae without such a shield . . . . 18.
17. Antennae simple; markings greenish-white . . . **brachycarpae** Roh.
Antennae beyond second joint enlarged, joints somewhat flattened, dentate beneath; markings yellow . . . . **latipes** Sm.
18. Ocelli in an equilateral triangle . . . . 19.
Ocelli in a low triangle . . . . 20.
19. Larger; entirely black . . . . **ater** Cress.
Smaller; more or less marked with yellow . . . . . **cockerelli** Roh.
20. Anterior femora simple . . . . 21.
Anterior femora produced at base beneath or spined . . . . . . 25.
21. Small; abdomen entirely black . . . . **errans** Fox.
Larger; abdomen marked with yellow . . . . 22.
22. Abdomen distinctly punctured; larger . . . . 23.
Abdomen impunctate; smaller . . . . 24.
23. Legs below coxæ ferruginous; punctures of dorsulum larger and more separated; wings darker . . . . . **ferrugineipes** Roh.
Legs black and yellow; punctures of dorsulum smaller and closer; wings dusky hyaline . . . . **dilectus** Cress.
24. Pronotum rounded anteriorly, without a spine . . . **trifasciatus** Say.
Pronotum keeled anteriorly and with a lateral spine . . **heraclei** Roh.
25. Larger; punctures large and strong; fore femora with strong spine; legs largely yellow . . . . **opwana** Roh.
Smaller; punctures very fine; fore femora produced at base beneath; legs almost entirely black . . . . **drymocallidis** Roh.

The types of all the new species described above are in the author's collection.

◆

BUTTERFLY FAKERS.—The butterfly was a beautiful deep blue, as lustrous as satin; but, looking at it closely, the collector shook his head.

"Another fake," he said. "See here."

And with his finger he brushed off the glistening blue dust from the insect's wings, and lo! it was but a common brown field butterfly after all.

"As the collecting of butterflies grows more popular," he explained, "more butterfly fakers turn up. These men, with various aniline dye powders, color up a ten-cent insect into a good resemblance to a $10 one. Their work is hard to detect, for the reason that, when the dye rubs off and discolors your fingers, you suspect nothing, since the genuine dust belonging to every butterfly's wings would do the same thing."—*Newspaper.*

Notes on Erebus odoratus L.

By C. H. Fernald, Amherst, Mass.

In the February number of Ent. News, page 83, Dr. Was. gave his experience in capturing *Erebus odora* L. in Oostburg Wis.

This insect was first named *Phalaena* (*Bombyx*) *odoratus* Linn. in the Systema Naturæ, ed. X, Vol. 1, page 505, 1758, and the same name was given in Clerck's Icones with a very fine colored figure of the female. In the twelfth edition of his Systema Naturæ, Vol. 1, Part II, page 811, 1767, Linnaeus changed the name to *Phalaena* (*Attacus*) *Odora*. Why it was changed from *odorata* to *odora* is not clear to me. Formerly, entomologists made use of the twelfth edition of the Systema Naturæ and only in recent times has the tenth edition been adopted as a starting point in Zoology. This accounts for the general use of the later name, *odora*, instead of the older one, *odorata*. Aurivillius has given a comparatively full synonomy of this insect in earlier works, in his Recensio Critica Lepidopterorum Musei Ludovicæ Ulricæ quæ descripsit Carolus A Linné, pages 151, and 152, 1882, which work seems to have been generally overlooked in this country. In accordance with the International Rules of Zoological Nomenclature, Articles 26 and 27, this insect should be known by the name of *Erebus odoratus* (L.).

Two specimens of this insect were taken on the same evening last summer in the city of Boston. One flew into an office in the Tremont building and the other flew into an open window of the Governor's office in the State House but a short distance away. In 1872 a specimen was found resting on one of the buildings at the University of Maine, at Orono, Maine, nine miles north of Bangor, which is in latitude 44° 54′ 2″ N., the farthest north that I have heard of the capture of this species.

The question whether this and other southern insects as the cotton worm, fly over seemingly enormous distances and are finally captured in these northern latitudes; whether they are accidentally carried north in the pupal stage; or whether they eed occasionally in the northern localities where they are und is an interesting one, and has been discussed pro and con r many years.

Erebus odoratus (L) has been taken 150 miles at sea, off the ast of Brazil, as stated by Walker in his Catalogue of Lepi- ptera Heterocera, Part XIV, Noctuidæ, page 1290, 1858, d in this case there is little doubt that the insect in question is blown off the coast by the wind and alighted on a ship the above named distance from the shore.

Julian P. Thomas, in an article entitled "Ballooning as a ort," published in Appleton's Magazine for November, 1906, ites that "as high as 2,000 feet there are still frequently seen tterflies, mosquitos, and other insects." We are further in- rmed that in the upper currents of air, even in strong winds, iile the balloon is carried along at a rate of 50 or 75 miles an ur, or even more, everything seems as quiet to the occupants the car as would be the case in a calm. Under such cir- mstances, may not moths, even as large as *Erebus odoratus,* swept in the strong upper currents of the air from the hama Islands where they breed, as far north as Orono, a dis- ice of about 1400 miles? Such a flight in a 50 mile breeze uld require but 28 hours.

The Green Aphis of the Chrysanthemum—Aphis rufomaculata n. sp.

By H. F. Wilson, Urbana, Illinois.

The specific name of this louse was suggested by the bright l spots which seem always to be present upon the abdomens the viviparous females.

arous viviparous.—♀.

eneral color green, head somewhat dusky on vertex, eyes light , prominent, thorax green, abdomen green with about 2 to 4 little dots—eyes of the embryos—showing on both the dorsal and ventral es, and a slight yellow discoloration at bases of cornicles. The ennae are light green at the base shading to blackish at the distal ls, femora pale green, tibiae very pale green, dusky at the distal ends only, tarsi black; style green to blackish, short and ensiform; the honey tubes are long and cylindrical, green at the base and shading into dusky at the ends, or all dusky, their peculiar form as described for alate female below; beak pale green, dusky at tip, barely reaching 3d coxae.

Measurements about as follows: body, 1.40 mm.; style, .11mm.; honey tubes, .27mm.; antenna, .80mm.; joints III, .17; IV, .13; V, .11; VI, .11; VII, .18mm. respectively.

Alate viviparous.—♀.

General color green, head dusky to black, eyes bright red and very prominent, prothorax green with dusky to black transverse band, mesothorax blackish upon central portion, lateral margins green, abdomen green; wings hyaline with distinct, rather conspicuous dark veins, the base green. The abdomen and the head are sometimes mottled with light orange; mesosternum black; the beak is a very light green, dusky at the end. Along each side of the green abdomen above there often are 4 or 5 small dusky spots which do not show in all specimens; style ensiform and .11 mm. long. Antennae about 1.06 mm long green at base and blackish beyond the middle of joint 3; 3d joint with about 12 sensoria, 4th with about 8, 5th with one large sensorium near the distal end and 2 or 3 along the middle portion; 6th, at the joining of the 7th, with six small and one large sensoria; joints about as follows: III, .27; IV, .17; V, .15; VI, .13; VII, .22 mm The femora are dusky at outer end or entirely light green, tibiae dusky to black at distal ends, tarsi black, cornicles dusky greenish yellow throughout cylindrical.

Length of body 1.30 mm; wing, 2.13 mm; stigma .60 mm, narrow and parallel-sided; cauda .11 mm dusky brown in color

The very broad head and very prominent compound eyes are striking peculiarities in this species. The cornicles which would be classed as cylindrical are somewhat constricted immediately back of the slight flange, then comes a slight enlargment from which the cornicle very gradually diminishes in diameter to the base.

During my study of this insect as a student in entomology at the Colorado Agricultural College during the winter and spring of 1906 and 7, I did not find it upon any plants but the chrysanthemums. It seems to be strictly a greenhouse species at Fort Collins, as neither Prof. Gillette nor any of his assistants have found it upon out of door plants.

New Pyralidae.

By Frank Haimbach, Philadelphia, Pa.

Symphysa ochralis sp. nov.

Expanse of wings 15 mm. Entire upper surface of wings bright ochre-yellow, the secondaries somewhat lighter apically. Markings as in *Symphysa eripalis.* On the under side, only the outer line is visible, which is shaded inwardly with a dark brown line, from which line the whole area to apex is light brown, darkest on primaries. Distinct discal dots on all wings on under side only.

Described from six specimens from Denver, Colo., vii, 17, '05 (Oslar).

Blepharomastix occidentalis sp. nov.

Expanse of wings 23 mm. Markings as in *Blepharomastix ranalis,* but heavier. Ground color is considerably darker than in *ranalis,* approximating brown, with the entire upper surface covered with evenly distributed dark brown atoms. The species is closely related to *ranalis,* but can be readily separated by its uniformly larger size, and darker color, also by the upper wings of male, which are narrower and more pointed.

Described from eight specimens collected by Mr. H. A. Kaeber, at Miller's Canyon, Huachuca Mountains, Ariz., July, 1907.

Blepharomastix nymphulalis sp. nov.

Expanse of wings 20 mm. Upper and under surfaces of both primaries and secondaries lustrous whitish ochre, with well defined brown markings, similar to *Nymphula ekthlipsis,* which it mimics in this respect. The markings are the same beneath as above. The species is closest to *Blepharomastix stenialis,* but the secondaries are more produced basally, and the markings are more distinct and ornate.

Described from nine specimens collected at Cincinnati, Ohio, by Miss Annette F. Braun, on June 12, 17, and July 2 to 10th.

Pyrausta inaequalis plagalis var. nov.

Differs from the Eastern form, by having the markings of the front wings supplemented with bright crimson red; the ground color is also lighter, and the markings are not so heavy. Hind wings, ground color bright orange, on which the lines are much finer.

Described from one specimen collected by Mr. H. A. Kaeber, at Miller's Canyon, Huachuca Mts., Ariz., July, '07. This may prove to be a distinct species, but having but the one specimen, it is probably better for the present to give it only a varietal name.

Crambus oslarellus sp. nov.

Expanse of wings 25-30 mm. Head and palpi cinereous. Primaries and thorax lustrous bronze, with a silvery white stripe from the base to near subterminal line; a tooth in the middle on the lower side, and a small white spot above the outer end of white stripes. Secondaries smoky white. The species closely resembles *Crambus praefectellus*, and has no doubt been confounded with it. The principal points of difference are its much larger size, the smoky hind wings, and the absence of reddish line inside of white subterminal line, which is present in *praefectellus*; also the subterminal line forms nearly a right angle, which is not the case in *praefectellus*.

Described from ten specimens, collected at Silverton, Colo., and Clear Creek, Colo., vii, 3, '07, by Mr. E. J. Oslar, in whose honor this species is named.

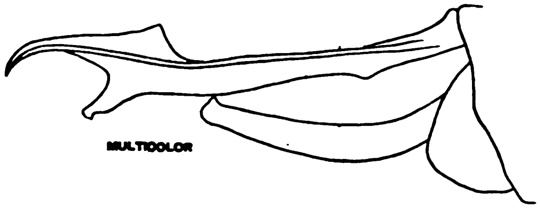
Three related American species of Aeshna (Odonata).

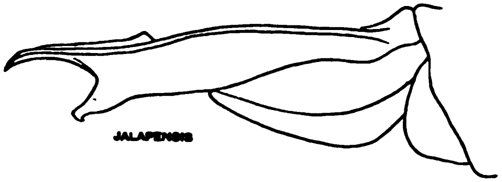
BY E. B. WILLIAMSON.

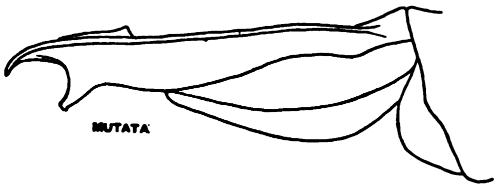
The three species are: *multicolor* Hagen, *mutata* Hagen and *jalapensis* n. sp. They are characterized as follows:

Rs forking proximal to the level of the stigma, with 3 or 4 rows of cells between the fork at the level of the distal end of stigma; the proximal side of the triangle in hind wing more than half as long as the posterior side; membranule fuscous with the base more or less white or gray; stigma of adult males dark brown or black above, dark yellowish brown beneath; immature males and females have the stigma golden yellow, paler beneath; a ventral spinulose tubercle on abdominal segment 1; a black T shaped spot on the frons, which spot widens posteriorly to enclose the vesicle in black, and margins the eyes in front with a line of black; thorax brown with a dorsal and two lateral stripes on each side, legs black, the first femora of both sexes beneath with a pale streak for half their length and all femora of females reddish brown above for the greater part of their length; abdomen constricted at segment 3; males with a minute median dorsal tooth on abdominal segment 10, and appendages seen in profile distinctly forked at apex with an angulate dorsal carina, anal appendages of the female of usual form, the apex rounded obtuse, varying from 5 to 7 mm in length in different species

DIFFERENTIALS: *Mutata* and *jalapensis* are separated at once from *multicolor*: males,- the inferior basal tubercle of the superior appendages in *multicolor* at one-fourth to one-fifth the length of the appendage, in *jalapensis* and *mutata* at one-sixth to one-seventh the length of the appendage; and the narrower appendage and higher keel of *multicolor* as compared with *jalapensis* and *mutata,* as seen in profile; females,—each abdominal appendage of *multicolor* is nearly symmetrical, the outer and inner edges with about the same curvature; the length 5 mm.; in *jalapensis* and *mutata* the outer edge of each appendage is nearly straight, the inner edge broadly curved; the length 6 mm. in *jalapensis* and 7 mm. in *mutata.* By appendages of males *jalapensis* and *mutata* are separated by the longer dorsal carina and apical fork of the superiors, and the shorter (one-half the length of the superiors) inferior in *jalapensis;* in *mutata* the apical fork is reduced in size and the inferior appendage is two-thirds the length of the superiors.







The ventral spinulose tubercle on abdominal segment 1 is most pronounced in *jalapensis* and *multicolor,* the spinulose area in *mutata* being raised into only a very low tubercle. On segment 2 on margins about the accessory genitalia *mutata* is more spinulose than the other two.

The T-shaped spot on frons is best developed in *jalapensis*. and of smallest area in *multicolor*. In *multicolor* the stem of the T in front is about .66 mm. wide and the sides of the stem are straight or slightly concave, diverging posteriorly and isolating the blue vesicle and the lateral ocelli from the blue area of the frons by a band of black about twice as wide as the ocelli. The ocelli are separated from the blue vesicle by a line of black narrower than the ocelli. In *mutata* the stem of the T in front is wider than in *multicolor* but scarcely 1 mm. wide. but the sides, instead of being concave, are distinctly convex. and the vesicle is less blue, the vesicle and the lateral ocelli more widely separated from the blue area of the frons, and the lateral ocelli separated from the vesicle by a line of black fully as wide as the ocelli. In *jalapensis* the stem of the T in front is over 1 mm. wide, the sides straight but more divergent than in the other two species, the lateral ocelli and vesicle isolated from the blue area of the frons by a band of black about three times as wide as the diameter of the ocelli; the extent of blue on the vesicle as in *mutata*.

In coloration of abdomen males of *mutata* and *multicolor* are almost identical, although the blue spots are slightly reduced in *mutata* especially on segment 10; *jalapensis* has the spots greatly reduced. A similar reduction is true also of the more obscurely colored females. In the matter of coloration of *jalapensis* and *mutata* we have an exactly parallel case in the two species with very similar appendages which have been associated under the name *constricta*. In this case, as in the case of *mutata* and *jalapensis*, the species with the dark colored abdomen is the slenderer, less robust of thorax. The habits of the two species associated under *constricta* are well known to me and are entirely distinct; it is probable that *mutata* and *jalapensis* show a parallel difference in habits.

Some venational characters of the three species are tabulated below. These may be summarized briefly, calling attention to *mutata* and *multicolor* especially, since in these venational differences are most constant.

1. *Mutata* compared with *multicolor* has narrower wings with distinctly less curved supplements and a more distal ter-

mination of Cu_1 at wing margin; (*jalapensis* is fairly intermediate in these characters).

2. In *mutata* the anal loop is distinctly wider, with a median cell and shorter outer side than in *multicolor*; (*jalapensis* has a wide anal loop of a form similar to *mutata,* but the outer side is variable in length).

3. *Mutata* has a larger number of cells in the wings as shown by:

a. The presence generally of two rows of cells throughout between M_3 and M_4 in hind wing distal to point where two rows of cells first appear between these veins; (*jalapensis* intermediate).

b. The larger number of cubito-anal cross veins in both front and hind wings; (*jalapensis* intermediate).

c. The larger number of cells in the triangle of hind wing; (*jalapensis* resembles *multicolor*).

d. The larger number of cross veins in the supertriangle of both front and hind wings; (*jalapensis* intermediate).

e. The larger number of antenodals and postnodals in both front and hind wings; (*jalapensis* resembles *mutata*).

f. The more proximal origin of M_{1a}; (*jalapensis* resembles *multicolor*).

4. In *mutata* the more distal position of the arculus in terms of its relation to antenodal crossveins; (*jalapensis* intermediate, resembling *mutata*).

TABULATION OF VENATIONAL CHARACTERS.

The figures in the columns headed respectively "*multicolor,*" "*jalapensis*" and "*mutata*" are in all cases those of percentages.

CHARACTERS		*multicolor*		*jalapensis*		*mutata*	
		10 ♂	2 ♀	5 ♂	1 ♀	10 ♂	2 ♀
		male	female	male	female	male	female
Length of stigma in front wing	3 mm.	30		100	100		
	3.5 "	70	50			50	
	4 "		50			50	100
M_{1a} in front wing arising	under stigma			10		15	
	at distal end of stigma			20	100	55	50
	beyond stigma	100	100	70		30	50

CHARACTERS		*multicolor*		*jalapensis*		
		10 ♂	2 ♀	5 ♂	1 ♀	10 ♂
		male	female	male	female	male
Wings narrower, supplements less curved (*a*)						100
Wings wider, supplements more curved (*b*)		100	100			
Wings intermediate in width, curving of supplements intermediate (*c*)				100	100	
Cu₁ in hind wing meeting wing margin with reference to level of nodus (*d*)	4 marginal cells beyond					10
	3 cells beyond		50			40
	2-3 cells beyond					20
	2 cells beyond	10		20	100	30
	1-2 cells beyond		50			
	1 cell beyond	40		40		
	on same level	50		40		
Anal loop wide, A_2 arising basal to the last cubito-anal (*e*) cross-vein before the subtriangle				100	100	100
Anal loop narrower, A_2 arising opposite or distal to last cubito-anal cross-vein		100	100			
Anal loop with a median cell (*i.e.* more than 2 cells wide near its middle)		30		100	100	100
Anal loop without a median cell		70	100			
Outer side of anal loop (formed by Cu_2 and A_1 before their separation) in hind wing	About as long as inner side of triangle (*f*)			20	100	100
	Longer than inner side of triangle (*g*)	100	100	80		
From the point where 2 rows of cells appear between M_3 and M_4 in hind wing to wing margin	2 rows of cells between throughout	15		40	100	75
	For at least part of this distance only 1 row of cells	85	100	60		25
Arculus in front wing	Opposite second antenodal	10	25			
	Between second and third nearer second	85	75	10		
	Between second and third, nearer third	5		90	100	25
	Opposite third					70
	Between third and fourth					5
Arculus in hind wing	Between first and second antenodals	90	25	10		10
	Opposite second	10	75	40		[illegible]
	Between second and third			50	100	[illegible]

CHARACTERS		*multicolor* 10 ♂	*multicolor* 2 ♀	*jalapensis* 5 ♂	*jalapensis* 1 ♀	*mutata* 10 ♂	*mutata* 2 ♀
		male	female	male	female	male	female
of triangle of l wing with rence to the s-veins be- n M$_{1-3}$ and	Between the third and fourth	25	25	20			
	Opposite fourth	45	50	10	50	20	
	Between the fourth and fifth	30	25	60	50	35	50
	Opposite fifth			10		10	50
	Between the fifth and sixth					30	
	Opposite sixth					5	
-anal cross-veins in front wing (*h*)	5	55	50	20		10	50 (*i*)
	6	45	50	80	100	40	50 (*j*)
	7					50	
-anal cross-veins in hind wing (*h*)	3	5 (*k*)					
	4	20	25				
	5	70	75	100	50	45	50
	6	5			50	55	50
le, front g	With two transverse cross-veins, 3-celled					10 (*l*)	
	With two transverse cross-veins, proximal cell divided, 4-celled	35	75	20	50	90	100
	With three transverse cross-veins, proximal cell divided, 5-celled	55	25	70	50		
	With three transverse cross-veins, two proximal cells divided, 6-celled	10 (*l*)		10			
le, hind g	With one transverse cross-vein, proximal cell divided, 3-celled	5					
	With two transverse cross-veins, proximal cell divided, 4-celled	85	100	60	100	10	50
	With three transverse cross-veins, proximal cell divided, 5 celled	10		40		90	50
triangular cross-veins in front wing	2	60	50	10		25	25
	3	40	50	90	100	70	75
	4					5	
triangular cross-veins in hind wing	1	25	25				
	2	75	75	100	100	40	75
	3					60	25

CHARACTERS		*multicolor*		*jalapensis*		
		10 ♂	2 ♀	5 ♂	1 ♀	10 ♂
		male	female	male	female	male
Antenodals in left front wing	14	10	50			
	15	30				
	16	30	50			
	17			60	100	10
	18	30		20		40
	19					40
	20			20		
	21					10
Postnodals in left front wing	7		50			
	8		50			
	9	40				10
	10	60		40		20
	11			40	100	50
	12			20		20
Ante- and postnodals in left front wing	21		50			
	24	30	50			
	25	20				
	26	20				
	27	10		20		20
	28	20		40	100	10
	29			20		10
	30					50
	31			20		
	33					10
Antenodals in left hind wing	9	10	100			
	10	40		40		
	11	40		40	100	20
	12	10		20		30
	13					40
	14					10
Postnodals in left hind wings	9		50			
	10	40	50			10
	11	20		40	100	10
	12	30		20		20
	13	10				60
	14			40		
Ante- and postnodals in left hind wing	18		50			
	19	10	50			
	20	30				
	21	10		40		
	22	10			100	20
	23	20		20		10
	24	20				
	25			20		30
	26			20		30
	27					10

NOTES ON THE PRECEDING TABULATION.

a. In all specimens 3 rows of cells between Rs and the radial supplement and M_4 and the median supplement, excepting in 2 ♂ hind wings, where there are 4 rows between M_4 and the median supplement.

b. In 3 ♂ there are 3 rows of cells throughout between Rs and the radial supplement and M_4 and the median supplement; in 5 ♂ there are 4 rows of cells between throughout; in 1 ♂ there are 3 rows between Rs and the radial supplement in both front wings and in one hind wing, 4 rows elsewhere; in 1 ♂ there are 4 rows between M_4 and the median supplement in both hind wings, 3 rows elsewhere; in 1 ♀ there are 4 rows between M_4 and the median supplement in one hind wing, 3 rows elsewhere; in 1 ♀ there are 3 rows between Rs and the radial supplement in one front wing, between M_4 and the median supplement in both front wings, and 4 rows elsewhere.

c. In 2 ♂ there are 4 rows of cells throughout between Rs and the radial supplement and M_4 and the median supplement; in 1 ♂ there are 3 rows of cells between throughout; in 2 ♂ there are 3 rows of cells throughout excepting that in both hind wings of each specimen there are 4 rows of cells between M_4 and the median supplement; in the ♀ there are 4 rows of cells between throughout, excepting between M_4 and the median supplement in one front wing and Rs and the radial supplement in one hind wing, where there are 3 rows. (It should be stated that curving of supplements does not vary in a species with variation in number of rows of cells between veins and supplements, though it is true that among species those with straightened supplements have a reduced number of included cells.)

d. This character is of slight if any value because of the difficulty of accurate determination due to varying degrees in which the wing veins of dried specimens do not lie in the same plane.

e. Excepting in 4 wings ♂, 2 wings ♀ *mutata* and 4 wings ♂, 2 wings ♀ *jalapensis* where A_2 arises distal to last cubito-anal crossvein, but the anal loop is of usual width.

f. In every case but 1 wing of a ♂ *mutata* there are 2 cells on distal side of this outer side of anal loop; in this one wing there is only 1 cell.

g. In 18 wings ♂, 2 wings ♀ *multicolor* there are 2 cells on distal side of outer side of anal loop; 2 wings ♂, 2 wings ♀ *multicolor* and 1 wing ♂ *jalapensis* with 3 rows of cells on distal side.

h. The crossveins forming the subtriangle and dividing the subtriangle are counted.

i. In these 2 wings ♂, 2 wings ♀ *mutata* the subtriangle is not crossed; in one other wing of *mutata* ♀ the subtriangle is free; in all other cases the subtriangle is once crossed.

j. One wing ♀ with free subtriangle.

k. The subtriangle free in this wing; crossed in all other wings examined.

l. One individual, both wings.

(To be continued.)

Incidental Studies of new species of Oscinis.

By E. S. Tucker,

Special Agent, Bureau of Entomology, U. S. Dept. of Agric.

In my incidental studies of flies which were obtained by personal collecting during past and more recent years, four forms have been found belonging in the genus *Oscinis*, which fail to agree with any known species, and, in consequence, they are named and described herewith as new.

Oscinis nigra n. sp.

Colorado,—Denver; August, 1906. Type: one specimen deposited in the U. S. National Museum.

Wholly black, except fulvous tinge of halteres, and dull reddish eyes. Body and legs shining. Triangular space of front extending from the vertex to a point against the antennal insertions, lower angular edges of front dull opaque. Dorsum of thorax minutely punctured, bearing scattered black bristles, sides fringed; scutellum having two apical bristles of great length.

First and second sections of wings equal in length, third section about two-thirds the length of either one of the preceding, and fourth section one-half the length. Third and fourth longitudinal veins scarcely divergent. Length, 1.5 mm.

This specimen differs from all previously described forms of *Oscinis* on account of total absence of yellow or fulvous color other than on the halteres.

Oscinis flavescens n. sp.

Colorado,—Manitou, 6620 ft.; August, 1894. Type: one specimen deposited in the U. S. National Museum.

Prevailing color yellow, with black markings as follows: A small spot on vertex enveloping the ocelli; three broad longitudinal stripes on mesonotum, the medial, except towards the distal end, is twice the width of a lateral one, beginning on the prothorax in advance of them and extending the entire length of mesonotum, while the lateral stripes taper to an end before reaching the posterior margin; metathorax polished black beneath the scutellum; dorsal base of abdomen and a median spot arising from anterior edge of second segment black. Basal margin with a pronounced and rounded middle expansion on each succeeding segment also black; two subfuscous spots on pleura posteriorly beneath base of wing, and a strong dash of black on posterior coxal plate.

Eyes black; vertex and front punctured, somewhat shining on triangular area; third antennal joint housed disciform, arista black, dorsum of thorax clothed with fine grayish pubescence which glistens on the black stripes, a fringe of black bristles extends along each side; scuttellum regularly rounded behind, nearly as long as the width.

First and second costal sections of the wings about equal in length; the third and fourth together equal to one of the preceding; third and fourth longitudinal veins parallel. Length, 1.75 mm.

According to Dr. C. F. Adams' table of *Oscinis,* this specimen runs to *nuda* Adams, but it appears as a form too extreme to be regarded even as a variety on account of the following differences: no sharp definition of vertical triangle; vittæ of thorax black instead of brown, and three in number instead of four; no additional line above base of wing unless extremely obscure; black spot lacking above middle coxæ, but two faint or obscure maculations on pleura; scutellum lacking apical pair of bristles, wholly bare, (may possibly be denuded, however); fore margins instead of hind margins of abdominal segments black; tips of tarsi not black; third section of costa more than one-half as long as second section.

Oscinis frontalis n. sp.

Texas.—Plano, Collin county; one female specimen collected in May at dusk in oat field, and one male in November, 1907. Types deposited in the U. S. National Museum.

Generally yellow; front dull, thorax with sericeous pubescence, abdomen somewhat shining. Vertical triangle impressed, not quite reaching to the antennæ, a black dot enclosing the ocelli, and a second dot beneath the ocellar spot in the frontal triangle of the male; hair of front black and stubby, suggestive of minute bristles; arista black. Eyes black with slight pale pubescence.

Dorsal vittæ four in number, brownish black on the female, black on the male, the middle pair but slightly parted and shorter than the lateral ones, all failing to reach the posterior margin of the mesonotum; an additional short narrow stripe above the base of the wing. Lateral suture of pleura strongly lined with black, and a short black dash runs above each posterior coxa. Scutellum evenly rounded, bearing a few black bristles, the apical pair stout. Similar black bristles fringe each side of the mesonotum, and a pair arises near the posterior margin of the dorsum, each bristle standing at the distal end of a lateral stripe.

Metanotum shining black; abdominal segments infuscated at base, the female being more suffused with a dark cast especially overspreading the middle; anterior edges of second segment with a distinct small black dot; venter immaculate; protruded tip of male genitalia and of ovipositor of female black; claws black.

Wings clear hyaline, second costal section twice the length of third section, third and fourth longitudinal veins parallel. Length, 1.5 mm.

Although running to *O. ovalis* Adams, these specimens differ particularly by reason of the double length of the second compared with the third costal sections of the wings, and by the rather unusual appearance of an almost bristly front.

Oscinis dissidens n. sp.

Texas,—Plano, Collin county; June, 1907, one specimen taken in an experiment cage in oat field. Type deposited in the U. S. National Museum.

Mostly shining black; face below the frontal triangle, together with the oral region and mouthparts, excepting the palpi, venter of abdomen largely and dorsal base obscurely, knees of anterior and middle legs slightly, tibiæ of middle legs obscurely, all trochanters and the tarsi except at tip, and halteres, yellowish. Frontal triangle extending across the vertex, polished, reaching two-thirds of the distance to the antennæ, adjoining outer edges of front dull, front projecting over the antennal insertions. Antennæ dull opaque, third joint inwardly sericeous, arista pale and faintly pubescent. Mesonotum with faint pale pubescence, two fine sulci running forward from posterior margin, scutellum with a pair of small terminal bristles.

Wings clear, first and second costal sections equal in length, third and fourth longitudinal veins parallel. Length scarcely more than 1 mm.

Runs to, and agrees in many respects with *O. obscura* according to Mr. Coquillett's description, but the following distinguishing features are noted: greater part of the front yellow, tibiæ of fore legs black instead of yellow, and the second longitudinal vein joins the costa at more than half the distance instead of midway between the apices of the first and third longitudinal veins.

Notes on the Psychodidae.

BY LEONARD HASEMAN, University of Missouri

Since the completion of my monograph of the North American Psychodidæ, which appeared in the Transactions of the American Entomological Society, Vol. XXXIII, I have been carefully watching for any new species and life histories which may turn up in this region.

The extreme minuteness and inconspicuousness of the adults, as well as the immature stages of these flies, makes their discovery in nature possible only by very close and persistent observations. While I have secured a number of my species on shaded windows and vine-clad walls of buildings, I have had far better results collecting the adults at night when they are readily attracted to lights. I have secured all my life histories by preparing vegetable cultures, in which they breed in great numbers. The past year two new life histories have been found, one of which proves to be that of a new species. A number of specimens collected between March 20 and June 20 have been identified as *Ps. schizura* Kin. Their wing length varies from 1.8 mm. to 2.8 mm., and they all have the black tufts at the tip of the veins and the alternate black and white markings which give the wings a mottled appearance. A few specimens collected between April 18 and May 24 have been identified as *Ps. cinera* Bks. This species has also been found fairly common in the caves of Indiana by Mr. A. M. Banta,* so that it probably appears over the entire range from the Atlantic to the Pacific.

Early in the spring of 1907 I collected a quantity of dry weeds and grass, and also some green grass and curly-dock leaves, which were put into two large square glass jars, covered with water and placed in the insectary to thoroughly ferment. In a short time mosquitoes appropriated the jars for their use. The adults and larvæ of the mosquitoes were collected and destroyed, and glass covers placed over the jars for a time. Later the covers were removed and early in June adult Psychodids were found in one of the jars. The cover was replaced on this jar and a large brood of adults appeared on the 13th of June. This jar was fairly teeming with them, while the other, which stood by its side, contained none at all. The first brood of larvæ and pupæ escaped my observation, but on the 15th of July a second brood of larvæ appeared, when the jar was removed to my laboratory and daily observations made on the habits of the larvæ, pupæ and adults. After the first adults were found in the jar, it was kept covered except when specimens were being removed. In this way five broods were reared during the summer. The adults of the first brood appearing June 13-20, the second July 17-20, the third August 8-12, the fourth August 20-27, and the fifth September 10-15. The broods gradually decreased in numbers of individuals until there were very few to appear in the last brood. The food supply began to get scarce after the second brood, and decaying potatoes were added, for which the larvæ showed great fondness.

---

* Carnegie Institute of Washington, publication No. 67, p. 84.

The second jar, containing the decaying vegetable culture, was left standing uncovered in the insectary all summer. The mosquitoes did not return to it and no signs of Psychodids appeared in it. The water nearly all evaporated, so that by the first of December only a small quantity of water remained in the bottom to keep the grass and weeds moist.

While rearranging the insect breeding cages on December 9, I was surprised on lifting up the jar containing the culture to see a half dozen or so adult Psychodids fly out of it. The jar was immediately covered and removed to my laboratory. On the following day a few more adults emerged, but by the most careful examination no larvæ or pupæ could be found. A number of the adults were collected and mounted, while the rest were left in the jar for breeding. The second brood of larvæ and pupæ appeared during Christmas vacation when I was away and on my return the 5th of January, a great many adults were present in the jar. Some of the adults were again collected and others left for breeding. On the 6th and 7th of January the first signs of larvæ were noted. They had just hatched and were extremely small, and unlike the larvæ of the other species I have observed, were very sluggish. The first pupæ from this brood of larvæ were found on the 15th of January and adults began to emerge on the 16th. Only three broods of this Psychodid were reared; the adults appearing Dec. — to Dec. 9; Dec. — to Jan 6; Jan. 16 to 25. Stragglers from the last brood continued to appear until the middle of February and a few specimens again appeared the last of March.

Returning to the first species, which was bred between June 15 and Sept. 15, I find, on comparing it with *Ps. floridus**

---

*Trans. Amer. Ent. Soc., Vol. xxxiii, pp. 316 and 324 ıt a close relation exists between the two forms. My ıterial of *Ps. floridica* has deteriorated considerably, especially : larvæ and adults, so that comparisons in some particular tails are made with considerable difficulty.

There is a very marked difference in the size of the Missouri d Florida specimens, the larvæ of the latter being from one-ırth to one-third larger. The difference in size also appears the pupæ and adults. The Florida larvæ have eight or nine rsal plates on the posterior annuli of the abdominal segments, ıile the Missouri larvæ have but six. The Florida larvæ ve no ventral thoracic plates, while the Missouri ones have o small widely separated plates on the posterior annulus of :h segment. Each of these plates bears two long bristling irs. In the living Missouri larvæ the internal organs show ·ough the body wall as a broad creamy-white band in the ;ion of the fourth and fifth abdominal segments, which did t appear in the Florida larvæ. These slight but uniformly ıstant differences convince me that this Missouri Psychodid not the same as the Florida one, though certainly very closely ated. The adults have been compared with *Ps. nocturnala* d their similarity in every respect is so great that I feel sure :y are the same species. The dates of their appearance also ·respond.

[find that my figures of *Ps. floridica* are slightly at fault the segmentation of the posterior end of the abdomen. In ne cases I find that the break between the last two annuli so marked that I mistook it for a segmental rather than an ıular division.

LARVA.

The larva is quite slender, cylindrical, measuring 11 mm. length and .8 mm. in breadth. Each of the three thoracic ;ments is rather distinctly divided into two annuli. The ıt abdominal segment also has two annuli, while each of the ıer six abdominal segments has three. Each annulus of the ɔ posterior abdominal segments has, on its dorsal surface, a all chitinous shield; the third shield of each segment being the largest. Each of the abdominal and thoracic annuli are well armed with short, closely set spike-like hairs, which are more or less arranged in girdles, due to the annular divisions. Besides these short hairs there are two or four longer curved hairs on the dorsal surface of the posterior annulus of each segment, likewise one or two along the sides of the same annuli, and two pairs of similar hairs on their ventral surface. The paired ventral hairs on the thoracic segments are mounted upon small, widely separated, circular plates, similar to the dorsal plates on the posterior annuli except much smaller.

In living specimens the internal organs in the region of the fourth and fifth abdominal segment show creamy-white through the body wall. This did not appear in the Florida larvæ and is also obsolete in alcoholic specimens. No signs of anal tracheal gills are present. The thoracic air nipples are present on the dorso-lateral portion of the second prothoracic annulus. As in the case of the Florida specimens, these were not seen to be used by the larvæ for breathing.

The larvæ have the greedy habit of engulfing everything that they can get hold of. The alimentary canal is continually distended with food. The internal organs appear very distinctly through the body-wall, especially in case of specimens preserved in alcohol. The protrusions surrounding the anal opening are much more pronounced than in the Florida specimens. A test was made to determine the length of time they could live under water without coming to the top to breathe and the limit was found to be about twenty-four hours, as in the case of the Florida larvæ.

PUPA.

The pupæ are found hidden in the debris at the surface of the water, where they are continually kept moist and where they can protrude their thoracic breathing tubes out above the surface. The pupæ are somewhat larger than those from Florida and the abdominal spines are slightly less developed. There is a very marked difference in the size of the male and female pupæ. The latter are both longer and more heavily built. Including the thoracic breathing tubes, which are quite long and slender, the female pupæ are 4 mm. in length and .85 mm. in breadth.

The spines along the sides of the pupæ are inconspicuous, usually ending in a fine bristle-like hair. On the ventral surface the first abdominal segment behind the tips of the wing sheaths has but a single row of spines. Along the median line are three or four small spines, bordered on each side by one large spine and these in turn by three or four smaller ones, which extend out to the lateral edge of the body. The next four abdominal segments each have two rows of spines. The anterior row on each segment consists of four medium-sized spines, well separated and placed at equal intervals. In the middle of the second row on each segment are three small, closely-set spines, which are bordered on each side by one large

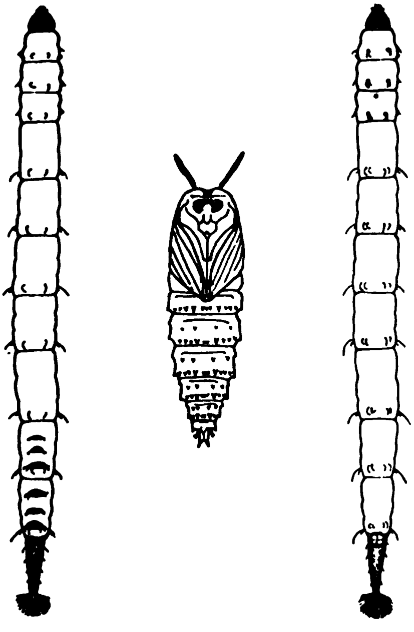


FIG. 1.—Dorsal and ventral view of larva and ventral view of pupa, *Ps. nocturnala* (X 20).

spine and these in turn by three or four spines, which decrease in size laterally. The posterior abdominal segment, viewed from the ventral side, has a basal portion, from the lateral sides of which projects a single strong spine, and from the ventral surface of which project two strong spikes, each of which terminates in two sharp spines. Posteriorly the segment is much constricted and terminates in two pointed spines with a narrow emargination between. Looking at the segment from the side, it can be seen that the dorsal half projects beyond the ventral portion and terminates in two very strong dorsally curved spines.

On the dorsal surface the segments have but a single row of spines. Along the median line of the back the first segment bearing spines has two small closely applied ones, the next two segments each have three and the next two segments each two. Lateral to these closely joined spines on each segment there is one strong spine, followed by three or four smaller ones. On the dorsal surface of the anterior abdominal and the thoracic segments there is usually a single papillæ bearing a fine bristle-like hair.

The dorsal spines curve slightly forward, while those on the ventral surface project backward. These help the pupæ in working their way up through the decaying vegetable material and in maintaining their position when they once get to the surface where their thoracic breathing tubes can be protruded out into the air.

The breathing tubes are very long and slender, with a short, much wrinkled stalk. The trachea can be traced to the very tip of the tube. There are two rows of small, circular foramina on the dorsal surface of each breathing tube. These foramina also surround the tip of the tube and extend some ways down the ventral surface in two rows.

In some cases the segments of the antennæ can be distinguished through the semi-transparent sheath. The ocelli can be seen through the sheath and are arranged in parallel rows extending almost at right angles to the longitudinal direction of the body. Some of the venation of the wings and the seg mentation of the tarsi can be distinguished through their sheaths.

Careful observations on the habits of the adults were made. They were often seen to settle upon the surface of the decaying material in the jar as if feeding, but I was unable to decide definitely concerning this; they may have been depositing eggs, as they were usually the large females.

The act of copulation was observed in a number of instances, and a few notes on these observations may be of interest to other entomologists. The males precede the females by a day or two and are very active by the time the females begin to emerge. Mating takes place soon after the females emerge and while they are yet quite sluggish. I have watched the males courting the females by taking a position immediately in front of them, where they remain perfectly motionless for several minutes, except for the continued waving of the antennæ, which are occasionally allowed to touch the antennæ of the female. When the males attempt copulation, they protrude the posterior end of the abdomen forward, much as the small Hymenopterous parasites do when they deposit eggs in plant lice, except that the abdomen is directed forward along the side of the body rather than directly underneath it. After the strong fang shaped male genitalia have firmly grasped the female, the insects turn end to end and have been seen to remain in coition for from one to two minutes. While in coition the wings stand roof-like, the male's being enclosed by the female's, much as in the case of butterflies.

Returning to the second Psychodid which was reared between December 9th and January 25th. This species differs very much from the other Psychodids I have observed. The larvæ are much shorter than the other forms and are broader than deep. The annulation is very distinct. The pupæ are short and plump, slightly broader than deep. The adult has been carefully compared with my other species, and as it does not conform to the descriptions of any of Bank's and Kincaid's species, I have decided that it is a new species.

LARVA.

The larvæ are extremely sluggish and have the habit of rolling themselves up in the decaying material and feigning death when disturbed. They are not nearly so greedy as the other forms, though they feed almost continuously. Occasionally they leave the culture and climb up along the sides of the vessel by carrying along with them a film of water. Specimens have often escaped from my watch-glasses and crawled about on the table until quite dry, but on replacing them in the glasses they would revive.

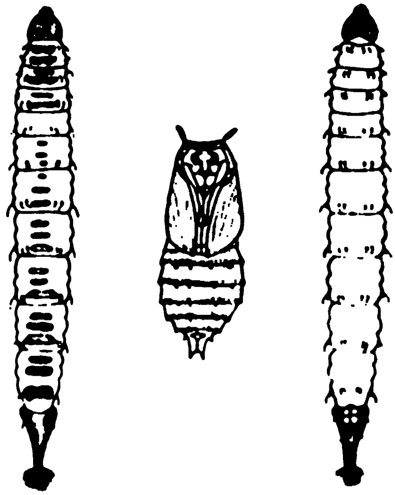


Fig. 2. Dorsal and ventral view of larvae and ventral view of pupa *Ps. domestica*, n. sp. (X 20)

The larvæ attain a length of from 6 to 7 mm. and a breadth of .8 mm., and are slightly flattened. The thoracic segments and the first abdominal have each two distinct annuli, while the next six abdominal segments have each three. Each annulus with the exception of those of the first abdominal segment, bears a distinct plate on its dorsal surface. There is some variation in the dorsal plates on the first three abdominal segments, and they are usually much reduced, though, as a rule, each annulus of the second and third segment bears a small plate, and often the anterior annulus of the first segment also bears a plate.

The plates at the posterior and anterior ends of the body are much the larger. The first and usually the second prothoracic and first mesothoracic plates are so cleft from behind along the median line as to form two plates placed side by side. Besides these dorsal plates the body is well armed with very short bristling hairs and a few long ones. The posterior annulus of each abdominal segment bears two pairs of long bristling hairs on its dorsal and ventral surfaces and one or more similar hairs on its lateral margin. The anterior annulus of the thoracic segments bears similar hairs. These hairs are mounted upon low papillæ and are usually curved rather than straight. One or both pairs on the dorsal surface of the posterior segments may be mounted upon the dorsal plates.

The larvæ possess the prothoracic air nipples, as in the other forms. So far as I have been able to determine, these are never used for respiration, unless perhaps when the larvæ leave the water and crawl up the sides of the jar or along on the straws and weeds which extend above the water. At this time they have only a thin film of water around them and the four small projections bearing the cilia which protect the posterior breathing pores are usually retracted so that these breathing pores are closed and at such times air may be taken through the thoracic air nipples.

While feeding and while in the water respiration is carried on entirely through the posterior spiracles. It is interesting to watch this operation. After the larva has been at the bottom of the jar feeding for a while, a small bubble of gas will begin to form at the tip of the breathing tube. This is continued until the bubble has reached a considerable size, when the larva stops feeding, lets go all hold, and rises to the surface much as an æronaut. On reaching the surface the bubble bursts, the cilia around the spiracles spread out and hold the larva in place until a new supply is drawn into the tracheal system, when the cilia are retracted and the weight of the body of the larva carries it to the bottom of the jar again, where it continues to feed. The fresh air in the tracheal system is under considerable pressure, so that the supply is not able to float the larva, but as soon as the pressure is released and the gas collects in a bubble at the tip of the tube, its buoyancy is sufficient to carry the larva to the surface. This operation is repeated every five minutes or so, depending upon the activity of the larva.

A test was made to determine the length of time the larvæ could remain submerged. For this purpose a small quantity of kerosene was poured over the water in a small dish and many of the larvæ were found to be still active after being deprived of air for a day.

PUPA.

The pupæ are oval in shape and somewhat flattened. They attain a length of 3.5 mm. and a breadth of .8 mm. The thoracic breathing tubes are much shorter than in the other forms, measuring about .25 mm. in length. The abdominal segments are well armed with numerous short, simple and compound spines. On the ventral surface the five segments posterior to the tip of the wing sheaths each has two rows of these spines. The first row on each segment is near its anterior edge and consists of four compound spines, well separated. The second row is near the posterior edge of the segment and consists of from six to nine small compound spines along the median line, bordered laterally by a single enlarged spine, and this followed laterally by a number of smaller ones. The compound spines consist of two or three small sharp spines borne on a low circular papilla. The posterior segment bears on its ventral surface a single strong compound spine, along the lateral edge of its slightly expanded base, while the tip is terminated by two slightly diverging strong simple spines with a broad emargination between.

The arrangement of the spines on the dorsal surface is almost the same as on the ventral surface. Each segment has two rows, but the spines of the second row are smaller and more closely set than on the ventral surface. Six of the abdominal segments bear these rows of spines on their dorsal surface.

while only five of them have spines on the ventral surface. The ventral surface of the first segment bearing dorsal spines is hidden by the tip of the wing sheaths. The dorsal portion of the last segment is curved dorsally and ends in two very strong spines. On the dorsal surface of the last segment near the base there are two laterally projecting spines as on the ventral surface.

The breathing tubes are club-shaped, with a short, much wrinkled stalk, and bear two longitudinal rows of foramina along their dorsal surface. The segmentation of the antennæ shows distinctly through their semi-transparent sheath.

Psychoda domestica n. sp.

Body dark brown to black, clothed with long black hair, which to the unaided eye gives the insect a distinct blackish appearance. Thorax lighter than abdomen, and in some specimens the hair has a brownish cast. Legs black with black hairs and scales, the latter on the hind tarsi brownish. Wings long, rather acutely rounded at the tip of second simple nervure; evenly and well clothed with long black hair; posterior fringe black, about one-half the breadth of wing; anterior fringe much narrower; dense tuft of long black hair on base of costa. Anterior furcation one-sixth length of wing nearer tip than posterior; slightly beyond middle of wing. Female wing, length 2.25 mm. to 3.25 mm.; breadth, .75 mm. to 1.00 mm. Male, length, 1.8 mm. to 1.85 mm.; breadth, .65 mm. to .7 mm. Length of antennæ about one and one-half breadth of wing; 16-jointed; 1, slightly longer than broad; 2, spherical; 3-13, with basal enlargements and terminal pedicles, which are slightly swollen in the middle; 14-16, much reduced and closely applied to 13 and to each other; 3-16, with dense whorls of smoky-black hairs; 1-2, with shorter hairs and scales. Male genitalia strongly developed; superior pair about as strong as inferior; two-jointed; basal quite strong, slightly longer than broad; second twice as long as first, slightly expanded at base, weaker distally where it terminates in a very acute claw; inferior genitalia one-jointed, greatly expanded at base, but tapers rapidly to tip, which bears a single long, strong papilla about one-half the length of the segment. Ovipositor and ventral plate yellowish brown; ventral plate broader than long, with broad emargination behind reaching half way to base; ovipositor as long as breadth of plate, much curved; plate and base of ovipositor armed with short hair.

Habitat:—Columbia, Missouri; bred in laboratory from December 9th to March 20th.

Some Observations at Southern Pines, N. Carolina

By Abram Herbert Manee, A. M.

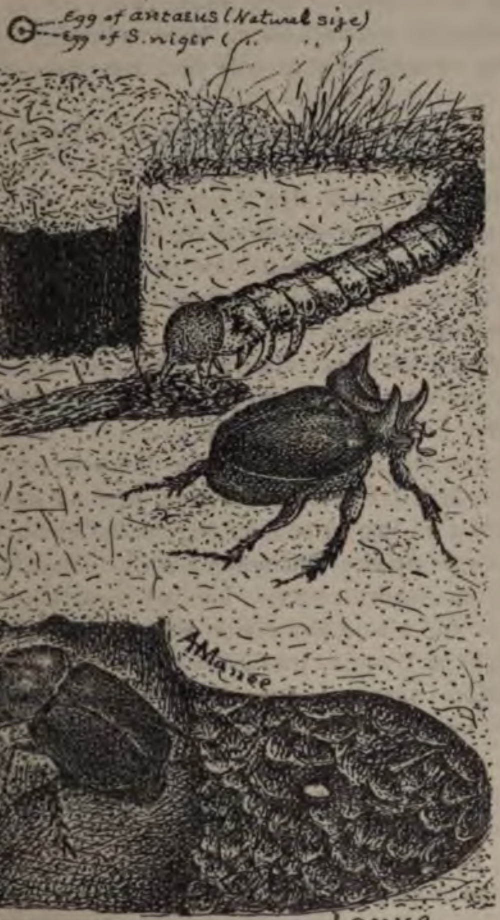
Strategus antaeus.

In these sand hills, where the long-leaf pines denude the ground of all but their own litter; in these black-jack barrens, where the many spaces bare among the tufts of wiry grass gleam white in vivid harmony with black and yellow; here, where neither stones nor gravel hinder plunge of trowel, there is free field for study, and in the World of the Little the tokens in the soil incite to special interest.

My first *antaeus*, picked up in winter, were charred by ground fires. In summer, '05, came my first polished males. On the night of July 11, '06, I took my first females by electric light. That same month we investigated an inch hole by a cart path and dug out a working male. July 26 I took my first pair from between two exposed roots of a large oak. They were pulverizing the surface soil, preparatory to shaft digging. After several such takings of pairs and singles, I came to know the peculiar mound of earth always pulverized to a depth of one to three inches. August 3d I dug beneath an old mound and found an egg. August 9th and 14th several more eggs, and I note as follows:

Beneath the mound of loosened soil an inch shaft extends vertically for six or eight inches. At bottom of shaft a one-and-a-quarter inch chamber reaches horizontally from one to five inches, and in this chamber, packed with finely broken bits of decadent oak leaves, a solitary egg is deposited. Sometimes two or rarely three such chambers diverge from the same shaft, but I believe with never more than one egg in each. A favorite haunt for nesting is by a pile of dead oak leaves wind blown in some hollow, from which I conclude that the young larva feeds on leaf debris and later on decayed oak roots.

The newly laid egg is oblong and white, in length fully three thirty-seconds of an inch. In three or four days the egg swells to globular and is fully one-eighth inch in diameter rom seven or eight eggs taken August 14th and placed in a lly tumbler I found on August 25th five larvæ from fiveghths to seven-eighths inches. They had eaten eggshells


Egg of antaeus (Natural size)
Egg of S. niger (" ")
AMamee

Strategus ♂ larva
antæus ♀ Egg in Nest
Fabr.

and some dead oak-leaf debris. The last larva emerged August 30th—length, five-sixteenths inch; color, white, with head fuscuous. In September one larva had become *cannibal* and *de-*

voured all the other larvae. (This probably accounts for the eggs being deposited solitarily.) October 12th the cannibal larva, less than two months old, had grown from its abnormal feeding to a length of two inches; color: head blackish, legs and spiracles yellow-brown, body whitish, with blue-black showing through, under side and last three segments blue-black.

From August, 1907, three larvæ from eggs were fed separately on dead oak leaves and roots, and at four months were only one inch long, so that the two months old two-inch cannibal specimen was doubtless of abnormal size. It would be interesting to rear a larva-fed *antaeus* grub into pupa or imago and note whether it would become a giant specimen or simply mature more rapidly.

Strategus splendens, Beauv. This rare species occurs here with a season at least two months earlier than *antaeus*. In June and July I find only dead specimens, and a fresh living beetle was dug from my garden January 1st, within a few feet of which I found on the same date an imago which had evidently died just after moulting, as the elytra were abortive.

Geotrupes balyi. This species buries not only animal droppings, but decadent fruits. I noted it working under spoiled cocoanut and also under refuse watermelon. Dr. L. O. Howard wrote me that this was a new observation.

Sandalus niger. I have discovered what was, I believe, hitherto unproved, that the *reddish male of Sandalus* is a sex variety of *niger*. Dr. Howard writes me that Dr. Horn, in his synopsis of the genus, suspected this relationship. He wrote also that my dates are interesting, as in the vicinity of Washington, D. C., where *S. niger* is rare, the mating season is not later than August. I note as follows:

"In November, 1904, took two or three living females on dead black-jack oak. In November, 1905, found a few females and Mr. R. S. Woglum, acting State Entomologist, took a red male, the first found here. In November, 1906, we took twenty females, three black males and two red males. I then suspected that the red males were *niger*, as we found *no red females* to correspond. In November, 1907, we took *forty* females, every one a black-brown *niger; four* black males and *fourteen* red males. Two of the black males were in sexual contact, and in several instances a red male, sometimes two, were attached to a *niger* female. On warm sunny days the red males were flying. It was exciting to draw one down by a wave of the net when it would descend on an incline and strike the ground like a pebble. If we simply allowed it to reach an oak most surely a female would be found quite near.

The season here for *niger* is October 26th to December 1. On this last date I took a female in the act of ovipositing. The egg is pure white, cylindrical, convex at each end, more than twice as long as wide and so minute (one-forty-fifth of an inch in length) that five lengths would not equal the diameter of the egg of *S. antaeus.** The eggs are irregularly clustered in a crack of bark or wood or on under side of loose bark of a *dead* branch or trunk of black-jack oak and are attached by *silken* or *webby* threads.

The female imago is a full inch in length, entirely nude of hair, with the nine outer segments of antennæ in *short* laminæ increasing to the thickened tip. The male is from 11-16 to 13-16 inclusive, in length; pubescent beneath and above especially on face; thorax and base of elytra, and with the nine antennal laminæ of equal length, 5-32 inch.

◆

Mr. E. T. Cresson, the distinguished Hymenopterist and treasurer of the American Entomological Society, has been in charge of the publications of the Society since 1861, a record of 47 years' unselfish service in the interest of entomology.

H. J. Quayle, assistant professor of Entomology in the University of California, will be located at the Southern California Pathological Laboratory, Whittier, Cal., after July first.

On September 3rd, 1907, I took a perfectly fresh specimen of *Callidryas agarithe* ♂, at Beach Haven, New Jersey; it was found in company with large numbers of *eubule,* of which I took twenty-one males and nine females. Is this not a new record for New Jersey? The specimen was in such perfect condition that it seems impossible that it could have flown up from the South.—W. G. Freedley, Jr.

---

*I estimate that 200 eggs of *S. niger* would equal in bulk one egg of *S. antaeus,* but *antaeus imago* is very heavy and *niger* imago very light. The egg of *Dynastes tityrus* is also small, one-half the diameter of that of *antaeus.*

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JUNE, 1908.

We have touched on this subject before, but would again like to remind our readers that we are not egotistical. To those who so kindly write articles for the NEWS we wish to say that the editors of this journal are the most learned people in the world, and in addition to that are mind readers. Also time hangs heavy on our hands as we have nothing to do. Don't take the trouble to number the pages of your Ms. as we can do it better. Write botanical names and names of places any old way. We know all the botanical names and have become familiar with all localities, having lived in each one.

When you give measurements of insects, especially new species, you need not write the figures plainly, as knowing everything we can readily decipher them. The names of all new and proposed species are known to us in advance, and knowing them yourself it is not necessary to be particular about how you write them. When writing us you need not be particular about your name and address, as we can read anything. If errors occur just blame us and the printer. The printer, by the way, is a wonder. He reads Russian, Chinese and Sanscrit with greater facility than he does English. The collecting season has begun, so we may be able to forget the editorial department for a time.

P. S.--Don't forget to mix up exchange notices and other matter for the NEWS with personal matter to the Editors.

Entomological Literature.

DIES IN NORTH AMERICAN MEMBRACIDÆ. By Edward P. Van Duzee. iis paper was published in the Bulletin of the Buffalo Society of iral Sciences Vol. ix, pp. 29-129., issued April 18th, 1908. The or gives the results of a systematic study of all the membracids is own collection and of material obtained from correspondents. ptical tables of the subfamilies, genera and species are given, and outline figures of many species. At the end of the paper is a list h includes all the species known to exist north of the Southern dary of the United States. The paper is a very valuable contribu- to the subject.

EDINGS OF THE HAWAIIAN ENTOMOLOGICAL SOCIETY. I part 5. iis gives an account of the meetings with notes and exhibitions, and contains the address of the President and a paper by G. W. aldy, entitled "A List of the Described Hemiptera (excluding rodidæ and Coccidæ) of the Hawaiian Islands."

REVISION OF THE TENEBRIONID SUBFAMILY CONIONTINÆ. By Thomas L. Casey. Proceeedings of the Washington Academy of Sciences; Vol. x, pp. 51-166.

ie Tenebrionid genera, *Eusattus, Coniontis, Coelus, Branchus* and *cis* and others, are considered, and new genera and many new es are described in this paper.

CTORY OF JESUIT NATURALISTS.

ederick A. Hillig, S. J., has compiled and published a pamphlet of iges under this title in No. 4 of Vol. II. of St. John's College terly, St. John's University, Toledo, Ohio, April, 1908. The s (arranged alphabetically), addresses, specialties in natural ry, desiderata and oblata of 108 members of the Society of Jesus ighout the world are given, followed by indices arranged accord- o specialties and to countries of residence.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

IE EGGS OF INSECTS OF THE LAKES OF CHALCO AND TEXCOCO, IN THE NITY OF MEXICO CITY AND THE FORMATION OF OOLITHS.—M. L. ux has a brief article on this subject in a publication not likely to nsulted by many entomologists—the recently issued Compte Rendu ie 10th Session of the International Geological Congress, held in

Mexico City in September, 1906, and published in that place under date of 1907, received in Philadelphia in March, 1908. M. Cayeux discusses (in French, pp. 1223-1227), first, the geological portion of a communication of Virlet d'Aoust "on the eggs of insects serving as food for man and giving rise to the formation of ooliths in the lacustrine limestones of Mexico" (Compte Rendus, Acad. Sci. Paris, vol 45, p. 865, 1857). Then, on the basis of material furnished him by the Mexican Geological Survey he concludes: It is undoubted that the egg of an insect, entire or broken, is a centre of concentration for the limestone of the lacustrine sediment and that it determines the formation of innumerable small, iregular nuclei, but in truth it does not form an oolith properly so called in the Mexican lakes. The globules which result from the molecular concentration of carbonate of lime around the eggs have the morphological characters of ooliths. They present, when they are complete, a central voluminous nucleus, in which are to be found all the elements of the lacustrine sediment, and a non-differentiated thin and irregular cortical zone. In white light, one never discerns concentric or radiate structure; in polarized light, the extremities of a well marked black cross are often observed. As they are to-day, these globules constitute a new and highly interesting category of *false ooliths*, that is corpuscles which to the naked eye are not to be distinguished from true ooliths and which arise—according to the sedimentation either by partial crystallization of a [illegible] sediment or by concentration of carbonate of lime around foreign bodies. The false ooliths in process of formation in the neighborhood of Mexico City are essentially different from ooliths with concentric structure so widespread in the primary and secondary [illegible]. However, the lacustrine and brackish water deposits of the [illegible] may contain some elements of the same origin. The [illegible] of this terrain is too little advanced to affirm that this category of pseudo-ooliths is not represented there.

[Neither M. Cayeux nor M. Virlet d'Aoust mention the species of insect concerned. Perhaps the eggs are those of C[illegible] [illegible] in many text books of entomology.]

ANNOUNCEMENT. The Lake Laboratory, maintained by the Ohio State University, announces the usual program for the coming summer, including courses in General Zoology and Botany, Entomology, Ornithology, Experimental Zoology, Comparative Anatomy, [illegible] Embryology, Invertebrate Morphology and Ichthyology, also opportunities for research work and accommodations for investigators as in previous years. The staff will include besides the Director, Professor E. L. Rice, of Ohio Wesleyan University, Professor Lynds Jones, of Oberlin, Professor Charles Brookover, of Buchtel College r M. E. Stickney, of Denison University, and W. B. Herms, ıt Fellow in Zoology at Harvard University.

pportunities offered are especially good in Entomology, and ttention is given to the aquatic life of the locality. Oppor- for research work in this line are very favorable. Independ- stigators are given the use of tables free of charge, but are to furnish their own microscopes and other apparatus. The is an excellent one for summer work, the laboratory being on the point separating Sandusky Bay and Lake Erie, with age on a fine beach.

rculars or detailed information, letters may be addressed to ctor, Professor Herbert Osborn, Ohio State University, Co- Ohio.

ose interested in exotic Rhopalocera the following note may be st: On the 19th of December, 1903, I took a fine male of *tera pegasus* at Garoet, Java, which locality is nearly one miles west of the western limit for species of the "priamus" The specimen was taken in a narrow native trail through the t the foot of the Papandajan, an active volcano less than ten m the town of Garoet.—WILLIAM G. FREEDLEY, JR.

A MOSQUITO LULLABY.

Hush, little skeeterbug, hush a-by,
Mother will rock him, don't you cry!
I know you are hungry, my little sweet,
With nothing to drink, and so little to eat,
The natives are tough, and their blood is thin,
But the city folks soon will be rolling in—
  Hush, little buzzer, go by.

Hush, little skeeterbug, hush a-by,
Think of the summer time, just you try!
Chubby old ladies and thin old boys,
Plump little children and, joy of joys,
Fat little babies, all fresh and sweet,
And juicy and lovely for you to eat.
  Hush, little buzzer, go by.

Hush, little skeeterbug, hush a-by,
Soon you'll be ready to buzz and fly.
Father will sharpen your dear little bill,
And mother will teach you to bite, she will!
Maybe they think we are slow and dumb,
But we are not afraid of petroleum!
  Hush, little buzzer, go by.—From *Chicago American.*

A HAPPY FAMILY OF BUGOLOGISTS.

To the Chief of the Bureau of Entomology, Doctor L. O. Ho
With the Consent of Dr. Dyar.

In 1878 when first we started the long strife
Against the tribe of bugs, against their life,
We kept the war up hot and bitter,
To exterminate the nasty critter,
Who claimed the world to be his own;
In every land in every zone.
At last, we found, we were too few,
To cope with this audacious crew,
But at this stage! we did expand,
Our progeny now claims the land!
We raised a family large and bold,
Which, with firm grip, and a fair hold,
Fights all our battles without fear,
Against all bugs though far or near,
We may, therefore, be justly proud!
Of such a bright and brilliant crowd.
Since then, some bright lights passed away,
While others went off, far astray,
To spread our doctrine here and there
Without a favor or a fear!
We have become a mighty tribe,
In woods, in barrens, and waste land!
Wherever we may be on hand.
We kill the lice, we kill the bugs,
But are quite careful of the frogs,
Who always prove a friend in need
When bugs are plentiful for feed.
We trap the skeeter in his lair,
When the sky is clear and fair,
Because we know he has a chink
Which we detect just in a wink.
It's well, therefore, our offspring grow
To give fraternity a show.
Times are so hard, these days of zest!
It's well to take a little rest,
To gather lots of pent up steam,
To bottle up another scheme
But! since it is now rather late,
And while the balance points at fate,
It's time for all to go to rest
To stand the strains of coming test
We therefore humbly do resign!
To efforts of the laws sublime

Theodore Pergande

Washington, D. C.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

I have for exchange fine *Parnassius apollo*, *delius*; *Arg. dia*, *adippe*, *amathusia*, *pales*; *Van. io*, *urticæ*; many Erebiæ; *Sat. hermione*, *circe*, *alliona*; *Lycæna bellargus*, etc. Wanted cocoons of *cynthia*, *promethia*, etc., pupæ of *ajax*, *turnus*, *troilus*, *cresphontes*, *myops*, *geminatus* and others.—J. W. H. Harrison, 181 Abingdon Rd., Middlesbro' England.

Noctuidæ wanted in exchange. Am especially in need of a good series of *Mamestra nimbosa* at present. Have only Noctuidae to offer.—F. H. Wolley Dod, Millarville, Alta, Canada.

Will purchase or exchange *Catocala* of Missouri for a copy of Hulst's Monograph on the genus *Catocala*.—Ernst Schwarz, 6310 Newstead Ave., St. Louis, Mo.

Exchange.—Nine double boxes named Coleoptera and a number of Entomological papers; would exchange for perfect Japanese gold fish.—Aug. Schmidt, 854 E. Russell St., Phila.

Wanted.—Bibl. of Econ. Ent., parts 1, 2, 3, 6, 8; Insect Life, vol. iv, Nos. 9-12, vol. v, Nos. 6-12, vol. vi, Nos. 6-12; Lintner's 3rd and 4th Reports. I have for exchange parts of Insect Life, Expt. Sta. Record, Buls. Bur. Ent., Biol. Surv., etc.—C. O. Houghton, Newark, Del.

Wanted.—Cerambycidæ, Cicindelidæ and other Coleoptera in exchange for same from this locality. Bound vol. i, Trans. Am. Ent. Soc., 1867-8, to exchange for Horn's Monograph of the Tenebrionidæ.—C. A. Frost, 40 Grant St., South Framingham, Mass.

We offer a large number of North American butterflies in exchange. Butterflies from the United States named gratis.—Entomological Dept., Acad. Nat. Sci., Logan Square, Philadelphia.

Will collect in almost any order of insects this season in exchange for Coleoptera from other localities.—R. J. Crew, 72 Sarah Street, Chester, E. Toronto, Canada.

Natural History reports issued in 1853, with the explorations and surveys for the first Pacific Railroad, will exchange for Lepidoptera.—Geo. Rossiter, 52 Tiverton Ave., Toronto, Canada.

Lucanidae and Scarabaeidæ purchased from all parts of N. America. Send price lists.—Dr. Garry de N. Hough, New Bedford, Mass.

Wanted in exchange or for cash during the coming season fertile eggs of the Apantesis group, especially such of the Southern and Western States.—M. Rothke, 807 Harrison Ave., Scranton, Pa.

Pamphila sassacus.—I am particularly anxious to get by purchase or exchange eggs of this skipper, and should like to receive with the eggs the butterfly which laid them.—J. Fletcher, Exper. Farm, Ottawa, Can.

Wanted.—Correspondence with those desiring to exchange Lepidoptera this season. Living pupae also to exchange or sell in November.—A. F. Porter, Decorah, Iowa.

Lepidoptera.—Wanted parties to exchange specimens not native to New England. Write for offers.—Will Place, Jr., 13 Parkes Ave., Providence, Rhode Island.

Will collect in all Orders, in exchange for Lepidoptera—American and exotic.—P. A. Schroers, 3807 Folsom Ave., St. Louis, Mo.

I have a great many fine exotic species of Buprestidae in duplicates which I would like to exchange for North American Coleoptera.—G. Chagnon, P. O. Box 186, Montreal, Canada.

Indian Insects in all orders. Specimens of *P. mayo*, *Kal. albofasciata*, *Hestia cadelli*, etc., from Andaman Islands, and *T. imperialis*, *A. [illegible]deva*, *Phylliums*, *Phasmids* and live cocoons from Darjeeling and Assam.—A. Meik, 4 Convent Road, Entally, Calcutta.

Lepidoptera.—I would like to correspond with those who expect to collect for cash in new and little known regions, South and West, during the coming season.—John L. Healy, 312 City Hall, Chicago, Ill.

Coleoptera.—Nine double boxes containing named beetles to exchange for perfect Japanese gold fish.—Aug. Schmidt, 845 E. Russell Street, Philadelphia, Pa.

For exchange.—Named Coleoptera, *Cal. relicta*, *bianca*, *phryma* and *S. columbia*.—A. W. Andrews, 186 Lothrop Ave., Detroit, Mich.

INSECTS OF NORTH CAROLINA

I am desirous of securing accurate data concerning occurrence of all species of insects in this State. Correspondence desired with parties or institutions having North Carolina material. Willing to pay for accurately prepared lists of any considerable number of species. Correspondence wanted with parties desiring material in certain groups from this State. Will gladly give suggestions to persons desiring to find suitable collecting grounds in this State to work at any season. In short, want the varied and interesting entomology of this State to be known and recognized by entomologists, and willing to assist in every way to make it known and get it recorded. About 300 miles of coast line and numerous mountain ranges and peaks 5000 to 6700 feet elevation; touches of subtropical and boreal faunas and all intergradations. In writing mention this advertisement.

FRANKLIN SHERMAN, JR., Entomologist
State Department of Agriculture, Raleigh, North Carolina

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,

6, Gunterstone Road, West Kensington, London, W.

Cat. No. 17 for 1908 (now ready) mailed free on demand.

The only dealers' list giving authors' names throughout. 100 named specimens, 1 quality ex Assam, 40 different species in papers, including *Papilio[illegible]*, *[illegible]les*, *gyas*, etc., mailed free on receipt of Post Office Order [illegible]. Explanatory Catalogue, with over 300 descriptions and many interesting notes 12 cents.

PARCELS SENT ON APPROVAL FOR SELECTION.

FOR SALE. COMPLETE SET OF EDWARDS' BUTTERFLIES
Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

NATURHISTORISCHES INSTITUT "KOSMOS."

HERMAN ROLLE, BERLIN, W. 30, SPEYERER STR. 8.

Offers Catalogues as follows:

Catalogue of Exotic Lepidoptera	6c	Catalogue of Exotic Coleoptera	[illegible]
Catalogue of Palæarctic Lepidoptera	12c.	Supplement to the Catalogue of Exotic Coleoptera	6c.

All catalogues are carefully arranged in systematical order following the [illegible] with indications of authors, families, subfamilies, localities, synonyms, etc.
Best help for the arrangement of the collections.

FOR SALE

'he following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, .25; *rizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. hornii*, .50; *Pasi-us mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. arizo-*. .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Monilema gigas*, .40; *Oncideres llatus*, .75; *Leptostylus yuccæ*, 50.; *Urodera crucifera*, 20; *Nodonota arizonica*, .25. the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus epigona*, .50; *nemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia alata*, *Spragueia plumbifimbriatus*, 25; *Hatima zethus*, .75; *Triprocris rata*, .30; *Gingla later-* .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North rican insects of all orders for sale, or exchange furnished on application.

H. SNOW - - - LAWRENCE, KANSAS

e Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

scribed in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

coons of HYPERCHIRIA PAMINA Neum.

and Var. AUROSEA Neum.

ARIZONA. FOOD PLANT, OAK. PRICE, $I.

to Buchholz, 382 Littleton Ave., Newark, N. J.

w Arrivals from Mexico, South Brazil and Java

ot of 100 perfect, correctly named, specimens from Java, with bright colored cies of *Euploea*, *Hypolimnas*, *Hestia*, *Neorina*, *Cethosia*, *Junonia*, *Kallima his* or *paralecta*, *Charaxes*, *Ixias*, etc., and 15 *Papilio* (f. inst. *coon*, *aristo-iae*, *gigon*, *arjuna* var. *gedeensis*), several varieties of the female *memnon*, for $7.50.

ot of 100 perfect, correctly named, specimens from Brazil or Mexico, with *Papilio*, $7.50.

PECIAL—*Papilio pilumnus*, ♂, $1.50, ♀, $2.50; *asclepias*, ♂, $2.00, ♀, $4.00; *rmaces*, ♂, $1.00, ♀, $1.50. *Morpho epistrophis*, ♂, 60c., ♀, $1.00. *Caligo tia*, ♂, 75c., ♀, $1.00. *Kallima inachis*, 40c.; *paralecta*, 60c. *Attacus* s, **very large**, ♂, 75c., ♀, $1.00.

O. FULDA, 816 BROADWAY, NEW YORK

When calling at my New York Store, mention NEWS to get special prices.

The Butterflies of the West Coas

A new book. Text, descriptive and critical, of all known species, illustra with thirty-two full page plates in best modern photographic color work, wi nearly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practical out of print; is not in any dealers' stock, and only a few copies now remain i the author's hands

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAS

An abridgement of the above, consisting of the full set of plates as issued i that book, with names of all species printed on pages facing the plates, b with no descriptive text; issued as the best possible substitute for that mo expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either boo address the author.

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFOR

WILLIAM J. GERHARD
SCIENTIFIC BOOKS

2209 CALLOWHILL STREET
PHILADELPHIA PA. U. S. A

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia 6 vols. 1861-67. Complete
Half morocco. Scarce. [illegible]
Same. A copy in original parts lacking vol. II No. 3 [illegible]

Strecker, H. Lepidoptera, Rhopaloceres and Heteroceres etc. 15 parts and 4 supplements. 4to. 1872-1900. 15 colored plates. Scarce. [illegible]

Say. Complete writings of Thomas Say on the Entomology of North America. Edited by J. L. LeConte. 2 vols. 1859. Cloth. 54 col'd pls. [illegible]

Saussure, H. de Études sur la famille des Vespides. I. Guepes solitaires de la tribu des Eumeniens. 1852. 22 colored plates. [illegible]
II. Guepes sociales ou de la tribu des Vespiens. 1853. 17 col'd pls. [illegible]
III. Monographie des Masariens. 1854. 14 col'd plates. [illegible]

Muller, H. Befruchtung der Blumen durch Insekten. 1873. With Weite Beobachtungen. 3 parts. 1879-82. [illegible]

WANTED Instructor in Elementary Entomology fo a Summer School for Boys. College gradu ate preferred. C. A. Schenck, Pisgah Forest, N. Caroli

URNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

r, E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec. Asso. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rogue, Louisiana

Advisory Board { L. O. Howard, S. A. Forbes, James Fletcher, H. A. Morgan, Herbert Osborn, H. T. Fernald

i-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

ms of Subscription :—In the United States, Cuba and Mexico, two dollars annually in advance; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

RNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

BUTTERFLIES AND MOTHS

OR SALE, CHEAP—A collection consisting of nearly 3000 named imens representing an excellent lot of interesting exotics, as well as a good s of North American species, both diurnals and nocturnals.

ed. M. Mueller, 167 Evanston Ave., Chicago, Ill.

OOO PIN-LABELS, TWENTY CENTS!

from the smallest type made. About 50 on a strip. No trimming—one cut makes a label. Send Money Orders s must be in multiples of 500, and no order will be filled for less than 500 each of 2 labels or 1,000 of one

V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

M LOOKING for collectors who deal with insects, pupae, butterflies and larvae from Mexico, Texas, Arizona and California paying cash. Reding further information, communicate with JOSEPH VER, 335 East 49th Street, New York.

OVA SCOTIAN LEPIDOPTERA.

Beautifully Mounted, in very fine condition, fully named and dated.

pecimens of 200 species, Catalogue value $65.00	$40 00
" 100 "	20 00
" 100 "	10.00
" European Lepidoptera, on pins	5.00

2500 specimens, Nova Scotian, to choose from. Expressage extra.

HN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER C

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YORK

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.

K.-S. Section Cabinets.

Schmitt Insect Boxes.

K.-S. Lepidoptera Boxes,
and Duplicate Boxes

K.-S. Screw Handle and
Nets.

The Asta Insect Pins:
White, 60c. per 1000.
Black, 70c. per 1000.

Catalogue II. Entomological Supp
Application.

THE KNY-SCHEERER CO

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPOSI
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect condition.
Single specimens and collections illustrating mimicry, protective colora
dimorphism, collections of representatives of the different orders of insects
Series of specimens illustrating insect life, color variation, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect box
Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

Stanford Univer
JUL
8
1908

JULY, 1908.

ENTOMOLOGICAL NEWS

Vol. XIX. No. 7.

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON. HENRY L. VIERECK. J. A. G. REHN.
PHILIP LAURENT. WILLIAM J. FOX. H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September,** in charge of the Ento
logical Section of the Academy of Natural Sciences, Philadelphia,
and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.

Outside of the United States and Canada, $1.20.

SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal disco
on longer insertions. No advertisement taken for less than
60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NEW
Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

FROM CUBA

PAPILIOS

Papilio devilliersi, male	$2.00
" *celadon*, male	.25
" *andraemon*, male	.30
" " female	.40
" [illegible]	.40
" *caiguanabus*, male	1.25

SPHINGIDAE

Amphonyx antaeus
Pseudosphinx tetrio, male
" " female
Ambulyx strigilis
Philampelus [illegible]
Cocytius duponchelii
Pachylia resumens
Phlegethontius rustica

The specimens are all in perfect condition, in papers.

Extra fine perfect specimens of *Phyllium siccifolium* (leaf insects) from Ceylon, $1.00 eac

Send 12 cents additional with each order to cover postage and packing.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, P

ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in bota
especially cacti and herpetology—reptiles and amphibians if notified early
the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th
New York City.

DR. R. E. KUNZE, Phoenix, Arizona.

CATALOGUE OF THE

NEUROPTEROID INSECT

(EXCEPT ODONATA)

OF THE UNITED STATES

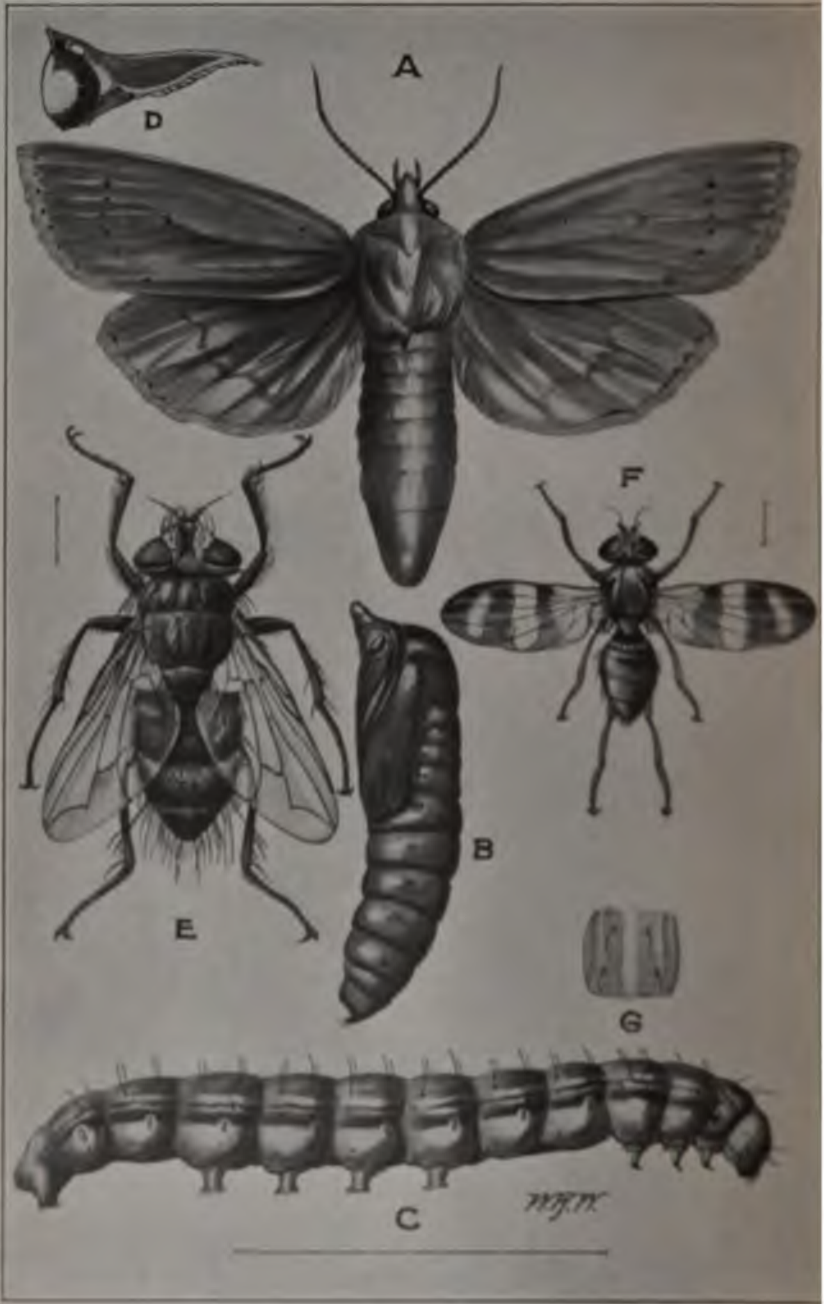
BY NATHAN BANKS

Complete to Summer of 1907 Price 50 cts. net per copy Mailed on receipt of p

☞ Send for copy of New Additions to ☜
Price List; just issued.

E. T. CRESSON, Treas., P. O. Box 248, Philadelphia, P

When Writing Please Mention "Entomological News."



NONAGRIA OBLONGA GROTE.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. JULY, 1908. No. 7.

CONTENTS:

Walton—Notes on the Life History of Nonagria oblonga Gr. 295
Smith—A new Mellinus 299
Williamson—Three related American species of Aeshna (Odonata) (continued from page 264) 301
Marlatt—Aspidiotus ancylus Putnam vs. circularis Fitch 309
Pearsall—Eupithecia miserulata Grote 312
Coolidge and Newcomer—The Life History of Pontia castoria Reakirt 314
Grossbeck—Plagodis schuylkillensis: a new Geometrid 315
Busck—Descriptions of two new Gelechidae from California, ... 316
Schaeffer—New Coleoptera, with notes on some New Jersey Histeridae.... 318
Patch—Crocigrapha normani Grote ... 321
Cockerell—Bees of the genus Nomada, belonging to the group of N. depressa Cresson 323
Paxson—Numerical Distribution of Some Insects 324
Editorial 338
Entomological Literature 339
Notes and News 339
Doings of Societies 342

Notes on the Life History of Nonagria oblonga Gr.

By W. R. WALTON, Harrisburg, Pa.

(Plate XII)

Early in the spring of 1907 the writer discovered evidences of the larva of a lepidopterous insect boring in the stalks of the common cat-tail rush (*Typha*) at Harrisburg, Pa. After a diligent search, a dead larva, much discolored, was secured and also the remains of a pupa shell which was within the burrow of the insect; these burrows were considerably more than a quarter of an inch in diameter and extended from 8 to 14 inches above the surface of the ground, leaving in most instances only a thin wall of tissue to support the stalk of the plant.

As the weather for some weeks after this was unusually cold and stormy, no further observations were attempted until June 10th, when a search was instituted in hope of securing the larva above mentioned. We were soon rewarded in finding it in several stages of growth within the stem of the plant.

From all appearances the larva feeds for a time on the sheath of the stem, as the smaller ones were doing at this time. As it increases in size it bores directly into the succulent central shoot, where it afterward remains until emerging as a mature insect.

On the date above mentioned the smallest larvae found measured less than one-half an inch in length, while the largest were fully an inch long.

Several of the larvae were kept under observation until nearly full fed, when they were removed to a cage and soon after pupated, the first pupa appearing on July 6th, the adult of which emerged July 18th, in the evening.

By July 21st nearly all the larvae to be found in nature had finished pupating, but two full fed larvae were secured on that date. The last larva in captivity pupated on July 28th and emerged on August 17th. The pupal period in this locality seems therefore to vary from 12 to 20 days, most of the moths however appeared in from 18 to 20 days after pupation occurred. In all, some seventeen adults were reared. The moth was identified by Dr. H. G. Dyar as *Nonagria permagna* Grote but as Dr. J. B. Smith has shown Grote's *permagna* and *oblonga* to be synonymous* we assume that *oblonga* takes precedence.

The life history of this moth has been given by Prof. Kellicott in Bull. Buffalo Society of Nat. Sci., Vol. 5, p. 40, 188[illegible]; under the name of *subcarnea;* this Dr. Smith has also shown to be a synonym of *oblonga* Grote.

Dr. W. J. Holland, in the "Moth Book" (my copy bears the imprint of the year 1905 on the title page), says "This is a southern species thus far only recorded from Florida," which is certainly an oversight, as Smith records the species from New York, New Jersey, Maine, Illinois and California.

The larva of the moth is quite two inches in length when mature and of a pale yellowish color with flesh colored stripes; it is bare save for a few bristles upon the back and sides.

The pupa is a bright chestnut color when new, but grows much darker as the time of emergence approaches. The moths of the genus *Nonagria* are peculiar in that they possess a clypeal spine, which is used by them in penetrating the [illegible] covering left by the larva to conceal the mouth of the tunnel.

The pupae show the development of this spine very plainly as may be seen in the illustration. A side view of the head of the female moth is also shown which is redrawn from Smith.

---

*Proceedings Ent. Soc. Washington, Vol. V, No. 4, p. 315.

I have been unable to find any record of the insect having been taken in Pennsylvania before, although Dr. Smith records it from several neighboring states and says "It is quite probable that the species will be found throughout the United States wherever the food plant (*Typha*) occurs."

The situation in which the larvae were found consists of a series of shallow pools, caused by the removal of clay for the use of a brickyard in operation nearby. These pools are bordered with the cat-tail rushes upon which the caterpillars subsist; the total area of the rush patches combined was something less than one acre in extent, but I am given to understand that the swampy tract has been in existence for over twenty years. Its elevation above sea level is almost precisely 400 feet, as shown by the city engineer's levels.

Usually not more than a single adult larva is found in a stalk, but in a few instances more were found; in one instance two healthy pupae were found in one stem. The plants in which the insects mature do not bear any fruit, as the injury inflicted is a most serious one, the central shoot dies and turns yellow and the infested plants can be singled out quite readily by this sign toward the approach of the time of pupation.

Fully 75 per cent. of the plants in the marsh seemed to be infested, but some animal seems to have a special fondness for the fat pupa, as more often than otherwise it had been extracted through a hole broken in the side of the stem. In some cases this seemed to be the work of a rodent, judging from the droppings that were found about such places. Observations lead me to believe that this species does not feed below the water line in its burrows. In cases where the water had receded from the base of the plant, the larva invariably descended to the very crown. But I was unable to discover a single case in which the insect went below the water line where water was actually present.

The moth is apparently not much attracted to light, as was shown by the fact that although collections were made almost nightly at a light not more than 100 yards from where the moths were emerging, not a single specimen was taken in this manner. Prof. Smith, however, records at least one instance in which it was taken at light. The moth resembles the color of the dead rushes so closely that it was unnoticed even in breeding jars for some time, and when sitting with the wings closed it resembles a swelling on the stem quite closely

During the rearing of the above-mentioned species, two species of Diptera were bred from its habitations that seem to bear a definite relation to its life-history; one, a Tachinid was reared from the larva of the insect.

This fly is figured herewith and Mr. C. H. T. Townsend, who examined it through the kindness of Dr. Howard, determined it to be a species of *Ceromasia* (*Masicera*).[*] The fly was bred from two separate groups of larvae taken at an interval of a week or so apart, one lot emerging on July 20th and the other on the 26th. Another fly which was reared from the tunnels in large numbers and which was found to inhabit the majority of abandoned burrows, is the Ortalid fly *Chaetopsis aenia* (Wied.), which is also the *Ortalis trifasciata* described in Say's complete works.

Dr. Howard states that he has reared the fly from corn-stalks; it has also been reared from sugar cane, and there is one instance on record in which it is supposed to have caused considerable injury to growing oats. However, I found no evidence to show that the fly fed on any but stalks that had been previously attacked by other insects. I notice two varieties of *C. aenia* bred from the same stems of *Typha*, both of which are spoken of by Loew in his "Monographs" One of them has the legs entirely yellow, while the other has a considerable amount of black upon the femora. They seem to be very generally infested with small mites which are especially numerous on the head of the fly and which remain on the same even when dried in the cabinet I have noticed specimens of *Muscina stabulans* similarly infested and have recently taken a very small Phorid that was literally alive with equally minute mites

---

[*] The species seems to agree in every way with Coquillett's description of *Masicera myoidaea* (Desv.), which has been reared from the larva of *Hydroecia nitela*.

DESCRIPTION OF PLATE XII.*

A. *Nonagria oblonga* (female), enlarged 2 diameters.
B. Pupa of same (female), enlarged 2 diameters.
C. Larva of same (female), enlarged 2 diameters.
D. Side view of head of female moth. Redrawn from Smith.
E. *Ceromasia sp.*, enlarged 4½ diameters.
F. *Chaetopsis aenia*, enalrged 4½ diameters.
G. Dorsal view of abdominal segment of larva.

A new Mellinus.

By HARRY S. SMITH, Lincoln, Nebraska.

A few weeks ago while working up the Nebraska species of *Mellinus* contained in the University collection, the writer came across a specimen from Indiana which appeared to be undescribed. Knowing that the collection of the American Entomological society was practically complete in this group, the specimen was sent to Mr. H. L. Viereck for comparison, who stated that it represented a species distinct from any in the above mentioned collection, where to his knowledge were all known species from America north of Mexico excepting *obscurus* Handlirsch, a description of which he very kindly sent me. The species is characterized as follows:

Mellinus wolcotti n. sp.

♀. Length, about 9 mm. Head short, transverse; cheeks, occiput, vertex and front with punctures extremely minute, and so close together as to appear granulate, rather dull; distance between posterior ocelli slightly greater than that between them and the inner eye margins; face and clypeus finely punctured, the latter with the anterior margin sinuate on each side of the median produced lobe, which is equal to slightly more than one-fourth of the width of the entire clypeus, and squarely truncate; clypeus with about a dozen rather long hairs on its disk, the produced lobe fringed with hairs anteriorly; upper portion of front showing short golden pubescence when viewed at the proper angle. Propleura punctatostriate, collar rounded at the sides. Mesonotum finely and closely punctured; a rather strong carina bounding the insertion of the anterior wings above; scutellum and postscutellum finely punctured, each with a rather large pit or fovea at each side; mesopleura and mesonotum finely and closely punctured as mesonotum; episternal groove strongly impressed and foveolated the entire length. Enclosed basal portion of metanotum U-shaped as in some species of *Alyson*, closely and finely punctured and somewhat shining; metapleura punctured as mesopleura or more sparsely so;

---

* Enlargement indicated is for a reduction to 4¼ inches in diameter.

posterior portion of metathorax somewhat roughened. Abdomen smooth, almost impunctate excepting apically and ventrally, where rather strong punctures are to be found, but the disks of these segments are practically impunctate; last ventral segment with a longitudinal keel or carina; dorsal surface of pygidium with large coarse punctures the intervening spaces with minute ones.

Coloration: Ground color of insect black, the following areas deep yellow: Mandibles except tips, clypeus, face below and between antennæ, inner orbits rather widely up to level of anterior ocelli, scape and pedicellum beneath (flagellum missing), collar above posterior portion of tubercles, part of tegulæ, a median spot on scutellum and postscutellum, a large ovate spot on each side of the third abdominal segment, a small lateral spot on four, a rather wide band on five narrowed laterally. The legs are colored as follows: Anterior coxæ, trochanters, femora and tibiæ in front, and tarsi, yellow; intermediate coxæ and trochanters with a yellow dot, femora and tibiæ in front yellow, tarsi rather darker; hind legs entirely brownish. Wings hyaline, iridescent, nervures dark brown.

Type—A female taken at Beaver, Indiana on August 17, 1894. I take pleasure in dedicating this species to Prof. Robt H. Wolcott, M.D., collector and donor of the specimen, who has added many valuable insects to the University collection.

The second abdominal segment has two or three tiny yellow spots showing through. Other specimens of the species are quite likely to have these spots more strongly developed, or entirely absent.

In order that students may have no difficulty in placing this species, the following modification of the latter portion of Fox's synopsis (Entomological News, V, p. 201, 1894) is submitted.

4. Clypeus, except fore margin in male, metathorax, petiole and second abdominal segment, without yellow markings, third abdominal segment with a yellow mark on each side; in the male the scape and first two joints of the flagellum beneath, yellow **bimaculatus.**

Clypeus entirely yellow (male unknown) 5

5. Two marks on basal portion of metathorax, basal half of first abdominal segment and maculations on second and third segments of abdomen, yellow (remaining segments without yellow) **alpestris.**

Metathorax and first abdominal segment without yellow maculations, segment four with a small lateral yellow spot, segment five with a continuous laterally narrowed band . . . **wolcotti.**

Three related American species of Aeshna (Odonata).

By E. B. Williamson.

(Continued from page 264)

Aeshna multicolor Hagen.

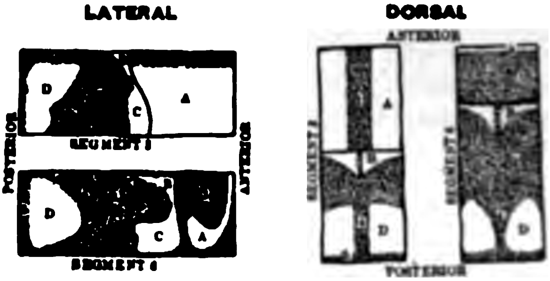
It is unnecessary to repeat descriptions and bibliographical references (see Calvert, Biol. Cent. Amer., Neur., p. 183). The range of the species is from Panama through the Mexican highlands into the Southern United States (headwaters of the Rio Grande and Pecos), and along the Pacific coast from Lower California to Victoria and Kootenay, British Columbia. Mr. Henshaw has kindly sent me photographs of five specimens labelled *multicolor* in the Hagen collection. As I surmised from the venation and as Professor Walker has recently certainly determined, two specimens, one from the Upper Missouri and one from the Yellowstone, represent two other species than *multicolor*. A male from Toluca, Mexico, collected by Dr. Calvert is here referred to *multicolor*. The T-spot on the frons is slightly wider, the first lateral thoracic stripe is somewhat narrower, the thorax is less robust, and the inferior appendage is shorter (not reaching the apex of the dorsal carina of the superiors) than in typical *multicolor*. The dorsal thoracic stripes, the color of abdomen, so far as can be definitely determined, and the superior appendages are typical *multicolor*.

As to the habits of *multicolor* little has been published. Mr. Currie (Proc. Ent. Soc. Wash., Vol. V, 1903, pages 299 and 300) has described the conditions at Williams and Winslow where *multicolor* was taken. From the coloration and robust form one might infer that *multicolor* is a sun-loving species, on the wing during the hottest part of the day, and frequenting still bodies of water (ponds or marshes).

Aeshna mutata Hagen.

Since its description (Neur. N. Amer. p. 124) by Hagen, no further attempt was made to identify this species until it was placed as a synonym under *multicolor* by Calvert in Biol. Cent. Amer. Neur., p. 183. Mr. Henshaw kindly sent me a photograph of the type (an imperfect female) which I identified as the same as the species I had taken at Bluffton, Indiana. Later Professor Walker compared an Indiana female with the type (which has only North America for locality) and pronounced them identical. At an earlier date Professor Walker had sent me two ♂ and one ♀, all teneral, of the species from Wilbraham, Mass., taken June 5, 1902. My specimens were taken at Bluffton from June 23 to July 13, 1907, 22 ♂, 1 ♀, all adult.

Color in life ♂.—Pale markings throughout, and eyes and face pale blue; rear of eyes shining black. Dorsal thoracic stripes 4 mm long, 1 mm. wide at narrowest point, widened above and below, nearly meeting at the mid-dorsal line at the antealar sinus. Lateral stripes undivided, the first 1 mm. wide below, wider and diffuse above, the upper extremity about 3 mm. wide; second stripe about 1 mm wide, the anterior (upper) edge nearly straight, the posterior (lower) edge less regular, the extreme upper end of the stripe wider. Abdomen[*]



AESHNA MUTATA ♂

Segment 1 brown, a dorsal apical spot and sides below apically blue; segment 2 blue, above basally, as far as the transverse carina [illegible] continuous with the brown on 1, a dorsal blue streak through the brown, a transverse brown stripe posterior to the transverse carina and at the apex of the segment, the lower surface of the auricles and a longitudinal streak posterior to them, brown, segment 3 anterior to carina blue (A)[†] with a dorsal longitudinal brown stripe [illegible]

---

[*] With post mortem changes the color pattern is often confused or [illegible] obliterated. So far as my material goes the greatest changes take place in the basal portion of the segments anterior to the transverse carina. In some segments where coloration posterior to the transverse carina is fairly well preserved, anterior to it all trace of [illegible] pattern has disappeared in a uniform dull brown.

[†] The letters and numerals apply to corresponding letters and numerals in the figures representing color pattern of segments 3 and 6.

tinuous with the apical brown ring on 2; posterior to the transverse carina brown (3), with a blue ring interrupted dorsally (2), just behind the carina (B and C), and a wide blue ring (D) interrupted dorsally. (4), just anterior to the apical brown ring (5) of the segment, segment 4 similar, brown stripe on dorsum anterior to transverse carina (1), wider, but not quite reaching base of segment, the wide blue interrupted ring near apex of segment (D) reduced in extent; segment 5 with area 1 still wider, 3 longer, 2 and 4 widening and B and D reduced and appearing as spots, rather than interrupted rings; in segment 7 B and C are isolated (A and C together are the "lateral divided basal spot" and D is the "apical spot" of Hagen); in segment 8 B is reduced to two minute spots, C is greatly reduced and A has disappeared; in segment 9 only D remains; in segment 10 variable faint small yellowish spots represent D.

♀.—Mouth parts bluish, labium olive green, anteclypeus plumbeous; above anteclypeus, green obscured with brown, a distinct narrow brown stripe on lower edge of frons in front; frons above dull bluish with black T-spot, which, with its continuation in front of the eyes, is narrowly margined with yellowish; eyes dark greenish-brown, paler below, a distinct narrow posterior green border widening and fading out below; rear of eyes shining black. Thorax with dorsal stripes divided each into a superior and inferior small green spot (described from a single specimen and probably not constant—there is great variation in color pattern of female *Aeshna* of the same species); two lateral stripes green, above yellowish; spots between wings green. Abdomen similar to male, but marked with green,—on first three or four segments the green margined with yellowish, on the posterior segments the green is obscured and drabbish. On segment 3 pale areas C and D are continuous laterally, and dark area is wider and darker. On segments 4-7 the dark areas 1 and 3 are on either side reddish brown near their centers, shading out to black at the margins; an extreme apical ring on 8 is pale dull brown; appendages brown.

In Wells County, Indiana, are few remnants of the old swamps which fifty years ago made the chills and ague of this country a constant menace to the early settlers and a perennial joke for those too wise to invade such an inhospitable wilderness. One of these swamps lies southeast of Bluffton, on land owned by three farmers. Two of the farmers are brothers named Vanemon, and the swamp may conveniently be known as the Vanemon Swamp. It is about three miles south of the Wabash River and is completely surrounded by woodland, its very existence being known to but few persons. At some distance from the swamp the woodland is typical hickory-oak growth. Immediately about the swamp are black ash, elm, pin-oak, red maple and a few sycamores. Willows and button bush fringe the swamp at several points. In the swamp itself *Sparganium eurycarpum* is most conspicuous. At one side is a large area of *Iris versicolor* and Carices abound along the eastern side. There are several areas of cat-tails and spatter dock (*Nymphaea advena*), the latter of which is noticeably increasing its territory. Duckweed (*Spirodela*) is abundant with other floating and submerged vegetation, and in spring the beautiful leaves of the yellow water crowfoot (*Ranunculus delphinifolius*) show splendidly through the clear water. A few years ago *Scirpus fluviatilis* appeared in the swamp and it has now increased to a considerable area. Associated with it is the rice grass, *Homalocenchrus oryzoides*. No other station for *Scirpus fluviatilis* is known for Wells County and a violet, *Viola conspersa*, growing near at hand in the low woodland, is known nowhere else in this county. Along the [illegible] area which drains the swamp during its brief period of overflow, *Caltha palustris*, a rare plant here, occurs sparingly.

In early spring dainty crustaceans (*Branchipus* [illegible]) in half invisible schools pulsate their aimless ways. The crayfish (*Cambarus acutus*), lives in the swamp and *Cambarus argillicola* burrows in the immediately adjacent woods. Spotted water snakes drop from the button bushes, the [illegible] are alive with spotted frogs and tree toads (*Hyla* [illegible]) may be gathered like inanimate objects from an old [illegible] fence or from the spatterdock leaves. Formerly, painted turtles and snapping turtles lived in the swamp but I have seen none for a year or two. There are no fish and but few salamanders (*Amblystoma*) in the swamp. Red winged blackbirds and green herons nest at the swamp. There is one muskrat [illegible] and raccoons are frequent visitors.

The waters teem with varied insect life. The number of species of dragonflies observed is not large but individuals of certain species are legion. This and one other swamp in Wells County are the only known stations in the state for *Sympetrum* *albifrons*, a species which has not been taken at the Vanemon Swamp since 1902, though it has been looked for carefully each year. It is possible the deepening of the outlet and the consequent drying up of the marsh in summer may have caused the disappearance, though the other swamp where *S. albifrons* occurs has been more modified in recent years than the Vanemon Swamp and during 1907 the capture of a single male there showed the species had not entirely disappeared from the county. I collected first about the Vanemon Swamp in 1900. From that year up to 1907 no Enallagmas were ever observed there. The first visit to the swamp in 1907 was on June 16. The swamp was reached only late in the afternoon after a day spent along the Wabash River. To my surprise a number of Enallagmas were seen. As many of these as possible were taken and later examination showed 43 ♂ and 15 ♀ of *Enallagma calverti* and 2 ♂ of *Enallagma cyathigerum*. Again on the afternoon of June 18, 34 ♂ and 10 ♀ of *E. calverti* and a pair of *E. cyathigerum* were collected. On another date *Enallagma aspersum* was plainly seen but not taken. *E. cyathigerum* has not before been reported for Indiana and *E. calverti* is known only from Lake Maxinkuckee. Repeated visits to several swamps and old gravel pits failed to locate any other colonies of *E. calverti* or *cyathigerum*. *Libellula quadrimaculata*, hitherto never seen about the Vanemon Swamp, was abundant in 1907, and a single ♂ of *Libellula vibrans*, a new inhabitant, was also taken.

On both afternoons, when collecting Enallagmas, I saw for a minute an *Aeshna* which flew leisurely once about the marsh and disappeared in the tree-tops. As it flew towards me, even at some distance, I saw by the brilliant blue of the eyes that it was a species entirely unknown to me. On June 23, I was at the swamp early in the morning. As soon as I arrived I noticed Aeshnas flying low over the marsh. A small patch of spatter-dock in open water was repeatedly visited, the Aeshnas flying slowly in and out, with much stationary fluttering among the leaf stems. Two males were soon captured and no others made their appearance. Eight subsequent visits were made to the swamp up to July 13 after which date no individuals were seen. On bright mornings when the eastern sky was unobscured they were hunting low over the western side of the marsh at 4.45 o'clock. One cloudy morning they did not appear at all. After 9 or 10 o'clock their visits to the marsh were rare and they were more wary, leaving the marsh when any effort was made to approach them and flying directly to or above the tree tops. When searching for food early in the morning they are less wary than I have ever seen *Aeshna constricta* which frequents the same marsh in autumn, and which is most actively on the wing in bright weather from 10 A. M. to 2 P. M. *Aeshna mutata* spends most of the day after 9 or 10 A. M. either resting in the trees or flying about over the tree-tops, very probably the latter. As is usual in the genus the night is spent clinging to the tree trunks or larger limbs at some elevation.

At an undrained button-bush swamp five miles north of Bluffton, two males of *Aeshna mutata* were seen and captured on June 30. Several *Libellula vibrans* were flying at this swamp but no *Libellula quadrimaculata* were seen. At a swamp [illegible] miles north of Bluffton which much resembles the Vanemon Swamp, and where *Sympetrum albifrons* has been taken, on June 30 *Libellula quadrimaculata* was so abundant that 4[illegible] specimens were caught in possibly half an hour, though they are not easily captured. At this swamp also in autumn, as at the Vanemon Swamp, *Aeshna constricta* is not rare. But *Aeshna mutata* was not taken at this swamp which in general resembles the Vanemon Swamp much more than does the button-bush swamp. Of these three swamps I have collected at the Vanemon Swamp most and I am reasonably sure that *Aeshna mutata* has not hitherto frequented this swamp since 1900. As to the appearance here for the first time in [illegible] of the three species of *Enallagma* (*cyathigerum*, [illegible] and *aspersum*) and two species of *Libellula* (*quadrimaculata* and *vibrans*) I am even more convinced than in the case of *Aeshna mutata*.

Aeshna jalapensis n. sp.

Abdomen exclusive of appendages, ♂ 44 mm., ♀ 43.5 mm., h. w. ♂ 45 mm., ♀ 47 mm.

Dorsal thoracic stripes about 3 mm. long, less than 1 mm. wide and narrowed at either end. First lateral stripe less than 1 mm. wide, of uniform width throughout and of definite pattern, not diffuse. Second lateral stripe similar to first, but slightly wider above on the upper (anterior) side, the lower (posterior) edge nearly straight. In the female the lateral stripes are slightly wider than in the male. Abdomen apparently variable, but blue areas greatly reduced. In no case do the pale areas B seem to be joined with pale areas C as on segments 4-6 in *mutata*. In four males collected by Dr. Calvert there is no trace of the apical pale spot, D, on segments 4-10. In a male collected by Mr. Godman [and in 1 ♂ collected by me at Jalapa, but not seen by Mr. Williamson—P. P. C.] these spots are present but obscure and reduced. In Dr. Calvert's four specimens segments 8-10 are entirely black, excepting pale narrow apical articulations on 8 and 9.

Through the kindness of Dr. Calvert I have studied four males collected by himself and one male and one female collected by Mr. F. D. Godman, all at Jalapa, Mexico. The types of *jalapensis* are one male in Dr. Calvert's collection, taken by himself, and the female in Mr. Godman's collection. The elevation of Jalapa is 4315 feet. Dr. Calvert writes that his specimens were taken along a small river which flows through the town, above a dam near a mill, where the current was slow, and between 10 A. M. and noon of a sunny September day, 1906. It is not impossible that *multicolor* may be found in the vicinity of Jalapa, as I have found the two species which have been associated under the name *constricta* at Bluffton, in one case flying within 100 feet of each other, but each plainly preferring its own habitat.

In the preparation of this paper I am under obligations to Dr. Calvert who has kindly loaned me several specimens of *multicolor*, from a wide range of localities, and the five males and one female of *jalapensis* which I have seen. To him I am also indebted for invaluable advice and criticism. Professor Walker kindly compared material with specimens at the M. C. Z. and loaned me two males and one female of *mutata* which Professor Needham had sent him for study. Mr. Henshaw furnished me with some details regarding Hagen's type of *mutata* and sent me photographs of specimens in the Hagen collection.

There may be some difference of opinion as to the status of the three forms here considered, and the question may arise as to whether they should be regarded as three species, or as two species and one sub-species or as one species and two sub-species. Among the dragonflies of North America at least there does not seem to be that geographical isolation to which is attributed the minor differences designated especially by ornithologists by trinomials* and I am unable to consider any of these three forms of dragonflies as having the same status as such sub-species. Moreover the custom of a becoming modesty in describing a form as a mere variety or sub-species of some earlier described form seems to place an unnecessary burden on and give a certain unwieldiness to nomenclature. The author's text, rather than the name proposed, should be relied on to give his ideas as to the characters, relations and distribution of the form described, though it must be admitted that in many cases the differences designated by a name are so slight that a single name expresses about all the real information the author seems to possess. At the present time trinomials are variously employed in different groups and by different authors in the same group. The use of binomials for all definable forms will obviate the perpetuation in nomenclature of haphazard guesses as to relationship within the genus.

[As I collected most of the material which Mr. Williamson has here described as *Ae. jalapensis*, n. sp., I may be permitted to state that my Jalapa material is similar to that collected by Mr. [illegible] at the same locality and listed as *Ae. mutata* Hag. in my work on Mexican and Central American Odonata (Biol. Cent. Amer. Neur., [illegible] June, 1905), and with which I compared it when writing page [illegible] of the supplement to the same work, that *jalapensis* corresponds approximately to the "males from Amula and Jalapa" mentioned as having narrow pale stripes on the sides of the thorax and smaller pale spots on the abdomen (*l. c.*, pp. 183, 400), which I did not consider worthy of a separate name, that I am not yet convinced of their [illegible] rights, much less their specific rank, and that Mr. Williamson and I disagree as to the recognition of subspecies by trinomials as a useful device of nomenclature. It is the old question between the "splitter" and the "lumper." P. P. CALVERT.]

---

*It must not be overlooked that North American dragonflies have not yet been as carefully collected and studied as many other groups. My statement here is merely in accord with our present knowledge

Aspidiotus ancylus Putnam vs. circularis Fitch.

By C. L. Marlatt.

The possibility that Fitch's "circular bark-louse" *Aspidiotus circularis* n. sp.* is identical with the insect so long known as Putnam's scale (*Aspidiotus ancylus* Putn.) has been suggested at various times, but no opportunity hitherto has offered to definitely settle the point. The belief in this identity is supported by Fitch's description of *circularis*, which is short enough to warrant quoting.

"No. 139. Circular Bark Louse, *Aspidiotus circularis,* new species. (Homoptera. Coccidae.)

"On the bark of currant stalks in gardens of the city of Albany, early in the spring, I have observed a minute circular flat scale, only 0.03 in diameter, similar to a species named *Aspidiotus Nerii,* but differently colored, being of the same blackish brown hue with the surrounding bark and having in the centre a smooth round wart-like elevation of a pale yellow color."

The MS. notes give, in addition to the above, the date of collection received and exact locality, viz: "April 14, 1856, on currant in Mr. Orcutt's garden, Albany."

This description is not sufficient to admit of the accurate identification of the insect, but *Aspidiotus ancylus* Putn. seemed to best correspond, and the name *circularis* is doubtfully referred to *ancylus* in Mrs. Fernald's Catalogue.

The identity of these two insects is still further supported by an examination of the large series of specimens representing *ancylus* in the Department collection. The accumulation of *ancylus* material by this Bureau, extending over twenty-eight years, shows the currant to be a common food plant of the species, and *ancylus* has been sent in on currant from twenty-nine localities, eight of which are from central New York. Furthermore, in response to a letter Doctor Felt sent to the writer, all of his *ancylus* material on currant from Albany, some five samples, all of which proved to be typical *ancylus*.

The opportunity to settle the point beyond all peradventure seemed to have come with the purchase by the Bureau of Entomology, of the Department of Agriculture, of the entire Fitch collection, together with his original notes. The writer's interest was very much aroused to find, included among the old moldy material, the identical specimen which Fitch had before him when he described *Aspidiotus circularis*, labeled in his own handwriting, and carrying his number and the date. It consisted of a single scale, removed from the wood and mounted on a bit of cardboard. The external appearance of this scale was exactly like that of *ancylus*. The pale yellow color as described by Fitch of the central spot or exuvium gives a rather wrong impression, for, in spite of the bleaching of more than fifty years, the exuvium still indicated a distinct orange coloration, and was really no more faded than specimens of *ancylus* in the Department collection dating from the time of Comstock, collected twenty-eight years ago. On softening the glue and lifting the scale, it was found that the insect itself was wanting. An attempt was made to clear the exuvium, hoping by this means to get the second stage of *ancylus*, which is sufficiently characteristic. Unfortunately the insect had not reached the second stage, and the exuvium proved to be of the larval form and much mutilated, and while very possibly *ancylus*, there are not enough structural features left to definitely decide this point. Furthermore, it has not been possible to distinguish by larval structures the scale insects closely allied to *ancylus*

---

* Third Report, No. 139, p. 108 (1856).

The evidence so far, however, seemed to point sufficiently distinctly to *ancylus* to justify the reduction of Putnam's name to synonymy and giving Fitch the credit for the species In the Fitch collection, however, were two other scale insects which had been given manuscript names only, and the descriptions never published. These were designated by Fitch as *Aspidiotus mali*, collected on apple, Albany, N Y., May, 1855 and *Aspidiotus patellaeformis*, collected on *Ulmus racemosa* May 14 of the same year, both lots preserved in situ on bits of bark The first proved to be *Aspidiotus forbesi* Johnson represented by four adult females, and the second, *Aspidiotus ancylus* Putn., represented by a single parasitized female of the second stage. The occurrence of *Aspidiotus forbesi* at Albany at that early date throws a doubt which, so far as the writer sees, cannot be removed, on the identity of Fitch's *circularis*. Examination of the records showed that *forbesi* is a species well represented in New York, and that currant is one of its food plants, and there is therefore a possibility, slight though it may be, that Fitch's *circularis* may have been *forbesi* instead of *ancylus*.

The writer has made a careful examination of the larval exuviae of specimens of *forbesi* and *ancylus*, and is unable, from the mutilated state of the Fitch specimen, to find any grounds for assigning it definitely to one of these species as against the other. In making the microscopic preparation of Fitch's *circularis* the waxy secretion dissolved and disappeared, and all that remains is the mutilated larval exuvium. If this exuvium were of the second stage its identification would be comparatively easy. As it stands, the problem must remain an open one. That *ancylus* equals *circularis* the writer has little doubt, but as long as there is a chance of error he does not feel warranted in reducing Putnam's name to synonymy. There is one good side to the case, however, and that is that Putnam's species must now always remain valid, and it certainly would have been a pity to have robbed Putnam, who, if he had lived, would doubtless have made a distinct name in science, of his only species.

There is one other *Aspidiotus* to which Fitch's specimen might now apply, namely, *Aspidiotus ostreaeformis* Curtis. The latter is, however, a European species, the presence of which in this country was first determined in 1899, the evidence pointing to its introduction some eight or ten years earlier. Its consideration in connection with *circularis*, therefore, may be dismissed.

* * *

PROF. W. M. WHEELER has been appointed to the professorship of economic entomology in the Graduate School of Applied Sciences in Harvard University. We congratulate Dr. Wheeler and also the University. He has also succeeded Dr. H. G. Dyar as editor of the *Journal* of the New York Entomological Society.

Eupithecia miserulata Grote.

RICHARD F. PEARSALL, Brooklyn, N. Y.

In order to identify this insect (the type being lost) the writer has examined, during the past three years, many thousand specimens, and over two hundred examples of the species, which he has become firmly convinced, should bear that name. A brief outline of the work done has been stated by Mr. J. A Grossbeck (Ent. News, Vol. 18, pages 342-346), much of it along independent lines, yet mutually helpful toward the one determination we most sought.

After I had left the city for the summer, he received the specimen from Philadelphia, which he finds to answer so exactly to Grote's description that he declares it to be *miserulata* and probably the lost type. Since my return it has not been possible for me to visit New Brunswick until ten days ago when we again examined this supposed type. Having carried with me a good series of the species we originally called *miserulata*, it was not difficult to convince Mr. Grossbeck that his supposed type was exactly the same with some of these. My object in relating this incident is not to discredit Mr. Grossbeck's judgment— for I consider it excellent—but to bring out the fact that Grote's description FITS NO OTHER SPECIES.

That an independent example, without locality, [illegible] be different, has been found to so exactly answer it, and then to discover that it comes back to the species we originally selected, seems to me a positive proof that we have the real *miserulata* "nailed down," taking also in connection with it the other facts we have gathered, and still further that it is the species reared from a larva which Mr. Grote saw in the collection of Mr. William T. Davis and named *miserulata*.

And what *is* this species? It is the *nebulosa* Hulst. The Rev. G. W. Taylor has given his opinion that another species (Can. Ent., Vol. 30, p. 168) sent by me to him, which I take rarely in Bronx Park and in the Catskill Mountains ([illegible] Peaks), is *miserulata*, but my series will in no wise answer Grote's description; and, further, *my* species is not the same as that he received from Mr. H. D. Merrick—an error Mr. Grossbeck immediately detected—describing the latter as *Eup. swettii* (Ent. News, Vol. 18, p. 346). Recently I received from Mr. F. A. Merrick two specimens taken April 27, 1902, by H. D. Merrick, presumably similar to those sent Mr. Taylor, which are identified by Mr. Grossbeck as *Eup. swettii.* Neither species answers Grote's opening sentence, "clear, grayish, silky;" they are different shades of brown. *Nebulosa* Hulst must stand as a synonym of *miserulata* Grote.

In our eastern Eupithecias the females show a tendency toward extreme forms of coloration, and this species is no exception. *Nebulosa* as represented by its type from Texas in the Brooklyn Inst. Museum is one of these, but I have one exactly like it, taken in the Catskill Mountains, also a ♀.

Between these and the usual type of *miserulata* may be found many gradient forms, one of which has certainly furnished the basis for the species recently described by Mr. L. W. Swett (Can. Ent., Vol. 39, p. 378) as *Eup. grossbeckiata,* which, therefore, becomes a synonym of *nebulosa*=*miserulata.* This latter conclusion was reached after an examination of specimens pronounced as such by Mr. Swett in the collection of the Am. Mus. of Nat. History, N. Y., and is concurred in by Mr. Grossbeck also.

Miserulata may be separated from all other species by the heavily *fasciculate-ciliate* antennæ of the male. The females also have the antennæ stouter and distinctly ciliate, with longer single spinose hairs at intervals—and in both sexes the front, vertex, thorax, and wing bases are usually overlaid with yellowish scales. Among some material loaned me by the U. S. Nat. Museum, through the courtesy of Dr. Dyar, are three specimens, also females, bearing a label "reared from larvæ on composite flowers, Selma, Ala., Oct. 1880, Patton," and beneath it in same hand another "*Eup. miscrulata* Gr.," which have on palpi, front, thorax, and sparingly along costa, and in submarginal space a sprinkling of reddish brown scales, but I cannot separate them from my series, and believe them to be as Mr. Patton has labeled them, *miserulata* Gr. It is our most common species, and is widely distributed. I have seen it from Wis., Ia., Ills., Mo., Tex., Ala., Ga., N. Car., Va., Tenn., Md., D. C., Penn., N. J., N. Y. and Mass.

The Life-History of Pontia castoria Reakirt.

BY KARL R. COOLIDGE AND ERVAL J. NEWCOMER.

Pontia castoria ranges from Central California to British Columbia. It is common in the vicinity of San Francisco Bay and we have also taken it very abundantly at Pacific Grove in Monterey County. It flies only in the open woods and the clearings near them and is on the wing, in Central California at least, from the end of January until the end of April. The larvæ feed upon the leaves of *Dentaria integrifolia* var. *californica* Nutt., a cruciferous plant having both cauline and radical leaves. This plant is practically the only crucifer growing in the woods where *castoria* flies so the larvæ probably do not feed upon any other. They will, however, eat leaves of *Brassica nigra* Linn. when nothing else is at hand. The egg is laid erect on the under side of both the cauline and radical leaves. As many as five or six have been found on a single leaf but whether or not they were laid by the same individual is uncertain. In one instance an egg was found on a young flower-bud. As soon as the young larva hatches, it eats most of the shell of the egg. It remains on the lower side of the leaf eating through it, not, as a rule, beginning at the edge. The larvæ do not usually eat all of the leaf but move to a fresh one when the first is eaten. They can easily be found by the holes eaten in the leaves and by the frass in the leaves below.

Egg. Tall fusiform, with the usual raised vertical ridges [illegible] fifteen in number, and numerous cross veins. When first laid the egg is of a pale greenish white color, about 1.5 mm. in height.

Young Larva. Length almost 2 mm.; at first of a glassy [illegible] color, but becoming more and more greenish tinged as the [illegible]; sparsely clothed with fine short hairs.

After First Moult. There is little or no change in the [illegible] of the larva now except a more pronounced yellowish green [illegible]; length, 6.5 mm.

After Second Moult.—Length about 10 mm.; of a uniform [illegible] greenish color; head hemispherical, slightly larger in diameter [illegible] rest of the body.

After Third Moult. Much as in preceding stage, but larger.

Full Grown Larva.—Length, 29 mm.; uniform grassy greenish [illegible] the exception of a darker dorsal stripe and a darker lateral stripe, above the spiracles; the entire surface covered with fine short whitish hairs, and larger more scattered blackish ones; ventral surface slightly lighter than dorsal.

Pupa.—When the pupa first emerges it is light yellowish green, darker around the head and thorax. The median dorsal line is yellow, and is most manifest on the first three segments and on the seventh and tenth inclusive. There is also a lateral yellowish line beginning on the fifth segment and continuing to the posterior end. There are a few black dots on each abdominal segment. As the pupa grows older its color changes to a light creamy white; a lateral black stripe appears, and the wing cases and thorax become decorated with a variety of black markings. These markings vary a great deal in different individuals. The outlines of the pupa also become more irregular; a projection appearing on the head, another on the dorsal line of the thorax, and two others, one just above the inner angle of each wing case. These projections are much like those on the chrysalis of *P. rapae,* but are more pronounced. Length, 21 mm.

Plagodis schuylkillensis: a new Geometrid.

By John A. Grossbeck.

Of all our Atlantic Coast Geometridæ it would appear that such large and strikingly colored forms as the species of *Plagodis* would long since have been described; nevertheless, in a recent paper in this journal (Vol. XVIII, p. 206), Mr. Pearsall characterizes a new one and separates two other species which had theretofore been regarded as belonging to a single species. It was even more surprising when Dr. Henry Skinner sent to me through Professor J. B. Smith two examples of a species which I could not identify in the Hulst collection nor in the literature, and my conclusion that it was new was confirmed by Mr. Pearsall to whom the specimens were sent for verification. It may be described as follows:

Plagodis schuylkillensis n. sp.

Expanse, 30.5—31.5 mm. across the apices of the wings, Anal angle of forewings excavated as in *emargataria* Gn. Head, palpi and collar purplish-brown, remainder of thorax and ground color of wings deep ochreous. Intradiscal line purplish-brown, rather narrow, and vaguely indicated, especially posteriorly where it is almost obsolete; it crosses at inner third of wing, being directed slightly outward in its course and is a trifle angulated outwardly on the cubital vein. The inner area limited by this line is faintly washed with lilac, strongest along the costa, and several dark purple atoms are in the angle formed by the union of the intradiscal line with the inner margin. Extradiscal line quite heavy, crossing at outer two-thirds of wing, purplish becoming blackish posteriorly and nearly straight, with an almost imperceptible out- and in-curve. Outer area washed with lilac along extradiscal line and sparingly strigate with blackish on anterior portion, more heavily on posterior portion. Fringe purplish-ochreous at extreme apex tipped with pure purple. Secondaries with a purplish line becoming blackish posteriorly on outer two-thirds of wing, similar to and continuous with the extradiscal line of primaries, but more curved and obsolete costally. The area within this line is pale ochreous being almost pure yellow and the field outside it is deep ochreous washed with lilac along the cross line and with a scattering of transverse blackish strigæ. Fringe as in primaries but decidedly purplish toward anal angle. Beneath, yellow on inner two-thirds and at apical area of fore wings; outer third of both wings, except at apical area referred to, light purplish, not well defined from the yellow color, and on secondaries sparsely strigate with black

Type—Two females in the Academy of Natural Sciences, Phila., and in Rutgers College, taken by Rev. I. F. Stidham, an enthusiastic and intelligent collector

Habitat—Falls of Schuylkill, Philadelphia, in August

In naming this new species *schuylkillensis* I am acting upon the suggestion of Dr. Skinner, who remarked that the general shade of the insect harmonized with the color of the water in the vicinity in which it was collected.

◆

Descriptions of two new Gelechidae from California.

By August Busck.

Recurvaria invictella n. sp.

Second joint of labial palpi pure white, terminal joint [illegible] white and with a conspicuous black longitudinal line in front from base to apex. Antennæ black. Tongue heavily scaled, pure white. Face silvery white. Head and thorax light mouse-colored. Forewings [illegible] silvery gray overlaid with brown and black scales, extreme base of wing brown, a slight sprinkling of dark scales on the cell and along the fold; at apical third is an outwardly angulated blackish [illegible] across the wing, not clearly defined toward the base of the wing, but exteriorly rather sharply edged by a whitish area; the tip liberally sprinkled with black and brown; cilia dirty white, sprinkled with dark scales and with a faint transverse line of brown before the tip. Hind wings light fuscous. Underside of body silvery white. Anterior legs brown with white tarsal annulations; posterior legs white, mottled with brown exteriorly. Alar expense: 12 mm.

Habitat—San Diego, California. (W. S. Wright, collector.)

Type—U. S. N. Mus. No. 11915.

A neat little species without the sinuation at vein 2 in the forewing normally characteristic of the genus, but otherwise conforming with the definition and undoubtedly properly placed. In the ornamentation of palpi and wings it reminds one somewhat of *Anacampsis paltadoriella* Busck.

Gelechia morenella n. sp.

Labial palpi white with base of second joint black and with entire terminal joint liberally sprinkled with black; brush evenly rounded. Antennæ purplish black. Face, head and thorax white; patagina black. Abdomen light golden fuscous, iridescent. Forewings deep purplish brown, nearly black, with two longitudinal white stripes; of these one is costal, beginning at the base of the wing and running very close to the costal edge and terminates at apical fifth; the other white streak covers broadly the dorsal edge from base to tornus, whence it bends slightly upwards along the terminal edge of the wing in a narrower and fainter spur, obscured by dark scaling. Cilia whitish dotted with black. Hindwings broader than the forewings, brownish fuscous; cilia lighter. Anterior legs brown; posterior legs dusky white, iridescent. Alar expanse: 16-18 mm.

Habitat—Morena and Pine Valley, San Diego, California, July 4-6. (G. H. Field, collector.)

Type—U. S. N. Mus. No. 11916.

A striking species of the black and white group, easily recognized by its ornamentation; in pattern it is very close to the larger yellow and black *Gelechia aristella,* Busck.

REMOVAL OF INSECTS FROM THE EAR.—Dr. Robbins removes live insects from the ear by placing the patient in a dark room and holding a lighted taper or lamp right up to the ear. The insects will back out. He has practiced this method for thirty-six years. Dr. Lewis removes them by the use of a pine rod six inches long tipped very lightly with the composition from a sticky fly paper. He was removed many in this way during thirty years' practice.

New Coleoptera, with notes on some New Jersey Histeridae.

By Charles Schaeffer, Brooklyn, N. Y.

Several years ago in Lakehurst, New Jersey, I took a single specimen of a Hister which seemed to be undescribed, but as the specific characters used in separating species in the entire family are more or less subject to variation, I thought it inadvisable to describe a new species from a unique. Lately, however, in going over some New Jersey material I noticed a number of specimens collected by my friends, William T. Davis in Lakehurst and Jamesburg, and Charles W. Leng, in Jamesburg and Brookville, which convinced me that the species is entitled to a name and in order that the name sent to Prof. Smith to be included in his forthcoming new list of New Jersey insects be sanctioned by a description, the species is described below.

In a recently purchased small miscellaneous lot of insects from the Santa Rita Mountains, Arizona, two species of Coleoptera were found to be undescribed and the present opportunity is taken to make these known.

Hister davisi n. sp.

Form and size of *americanus*. Outer thoracic stria absent, inner entire and slightly sinuate near base; surface of thorax very sparsely punctate near the striae, punctuation almost absent from the disc. Elytra with four entire discal striae; the fourth slightly abbreviated at base, fifth stria apical not quite reaching to the middle, sutural stria entire and strongly arcuate at base, not connected with the fourth; one distinct subhumeral stria, which does not quite extend to base; all the striae rather strongly impressed and finely punctate, surface almost impunctate. Epipleura bistriate, the inner stria finer and shorter than the outer, the latter rather coarsely punctate. Prosternum slightly flattened behind, on each side a short basal stria, which does not extend to the middle. Mesosternum truncate. Anterior tibiae [illegible]-dentate, the two upper teeth small. Propygidium coarsely but sparsely punctate, pygidium not as coarsely punctate as propygidium. Length, 3.5 mm.

New Jersey; Lakehurst (Davis, Schaeffer), Jamesburg (Davis, Leng), Brookville (Leng). August and September.

This distinct little species is to be placed in our list between *ambigena* and *americanus*. From the former it differs by having only one subhumeral stria, the fifth dorsal stria short, apical, and the outer thoracic stria absent; the possession of a distinct subhumeral stria, and the rather depressed prosternum with two short basal stria distinguishes *davisi* from *americanus*. The possession of prosternal striae would place this species in Dr. Horn's group *servus*, but as these striae are variable and absent in some specimens—which is also found occasionally in *defectus* and *servus*—and the mesosternum is distinctly truncate I prefer to place it with *americanus* and allies.

Most of the specimens before me were collected by my friend, Mr. William T. Davis, to whom this species is dedicated.

The number and size of the elytral and thoracic striae have been used to distinguish a number of species. However, one or the other of the elytral striae varies or may be entirely absent. I have a specimen of *defectus* Hald. from Southern New Jersey which has the fourth elytral stria not entire, but greatly abbreviated behind; another specimen which I collected in Lakehurst has the fourth elytral stria represented by a short basal and apical stria. A specimen from New Jersey (O. Dietz), belonging in Dr. Horn's *americanus* group, differs only from the description of *exaratus* by having the surface distinctly punctured. The punctuation in *perplexus* is sometimes so fine that it can be easily overlooked and the outer thoracic striae are occasionally extremely short, which seems to show that *americanus*, *perplexus* and *exaratus* are one variable species.

Listrochelus tarsalis n. sp.

Form of *opacicollis* Horn which it also resembles in the opaque and pruinose upper surface. Head densely cribrately punctate and hairy; frontal suture obsolete; clypeus transverse, feebly emarginate at middle, margin feebly reflexed. Thorax strongly transverse; sides angulately rounded below middle; margins coarsely crenulate and fimbriate; apical and basal angles rounded; surface sparsely, obsoletely punctate. Elytra sparsely but distinctly punctate, each puncture bearing a moderately long hair; sutural costae feeble; discal costae absent.

Metasternum rather densely clothed with long whitish hairs; abdomen very sparsely clothed with shorter pubescence. Length, 11.5-12.5 mm.

Male.—Antennal club longer than the funicle. Second and third abdominal segments slightly convex, fourth longitudinally impressed at middle. Pygidium convex shining, sparsely punctate and broadly rounded at tip. Claws of anterior tarsi feebly serrulate in basal half, without median tooth; outer intermediate, and posterior claws feebly toothed at middle and feebly serrulate in basal half, median tooth of inner claws obsolete: First joint of anterior tarsi acutely produced at inner apical angle. First joint of posterior tarsi broadly dilated inside, with inner apical angle acutely produced. First three joints of hind tarsi and tibiae clothed with long hairs. Spurs of posterior tibiae slender, equal in size.

Female.—Club of antennae shorter than the funicle. Claws on all the tarsi alike, with a small tooth at middle with the basal portion feebly serrulate. Inner apical angle of first joint of anterior tarsi acutely produced. Posterior tibiae feebly fimbriate within with a few shorter hairs than in the male. Pygidium feebly convex, shining at apex, but pruinose at basal half.

Santa Rita Mountains, Arizona.

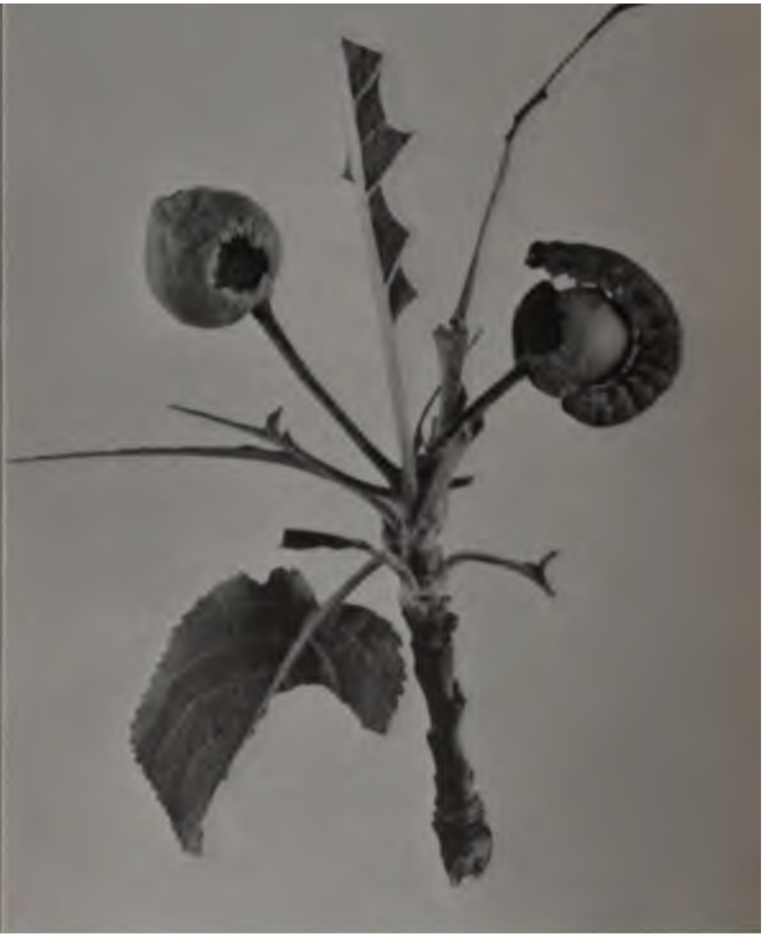
This species is apt to be taken for a small *opacicollis* Horn, but the male of the latter species has the claws similar on all the tarsi and the first joint of hind tarsi normal, not broadly dilated, and the female has the first joint of anterior tarsi not acutely produced at inner apical angle as in *tarsalis*.

Pyrota obliquefascia n. sp.

Slightly more elongate than *akhurstiana* Horn, and the black color of elytra divided by a narrow oblique pale fascia. Head yellow, a spot on the occiput and the space above each eye black; surface shining, moderately coarsely and rather sparsely punctate. Thorax narrow, elongate, sides parallel from base to slightly above middle, then obliquely narrowing to apex, surface shining, sparsely punctate, color black, a median vitta, widening at apex and base, and on each side a short oblique vitta yellow. Elytra dull, rather densely and coarsely punctate, feebly rugulose and faintly bicostate on each side; color black, base, suture, apex and side margins yellow, the [illegible] each elytron connected at middle with the side margin by an oblique yellow fascia. Underside and legs black, except the femora at base yellow. Length, 15-23 mm.

Santa Rita Mountains, Arizona (Marsden).

The male of this species has the third antennal joint [illegible]



larly formed as in *akhurstiana* Horn and the last joint of maxillary palpus as in *postica* Lec. In the female the third joint of antennae is feebly curved near base, but is narrower at base than at apex and the last joint of maxillary palpus is elongate and feebly flattened.

From all the North American and Mexican species of *Pyrota* so far known *obliquefascia* will be readily distinguished by the obliquely divided black, broad elytral vitta. From those species of which it may be considered a variety, the narrower, elongate thorax, the form of the third antennal joint and last joint of maxillary palpus will separate it.

◆

Crocigrapha normani Grote.

By Edith M. Patch, Orono, Maine.

(Plate XIII)

A mass of lepidopterous eggs flatly attached to a leaf of wild cherry was collected near Orono, June 12, 1907. These hatched June 14th and were fed from that time upon apple in the insectary. As the larvæ, noctuids of no very distinctive features, did not answer the description of any known to feed upon wild cherry or apple, they were bred in order to establish their identity. By July 15th about half of the lot had pupated, the others pupating from seven to ten days later.

As to their feeding habits it may be said that they remained day and night upon the branches of apple with which their cage was kept supplied, and they fed greedily upon both the leaves and the green apples which they ate to the core. They were easily disturbed, however, and would then commonly drop to the floor of the cage. They took long periods of rest during the day and particularly when nearly grown did their most vigorous feeding at night, though they lunched also by daylight.

Pupation took place in the earth which was provided in their cage. Although the larvæ were all from one brood and they hatched at the same date, their growth was not uniform in spite of the fact that they were kept under precisely the same conditions, and the last of the pupae were formed more than two weeks after the first.

One moth emerged in the laboratory in May, 1908, and this was identified by Dr. Harrison G. Dyar as *Crocigrapha normani*, Grote. Several other pupae were alive at this time, but in an attempt to hasten their emerging they were overheated and killed.

As nothing whatever is recorded of the life-history of this moth, the following description of the larva is taken from my notes at the Maine Agricultural Experiment Station:

June 29, 1907. Larva half grown. Head clear amber in color with two glistening black spots on each lobe. Ventral and ventro-lateral body and pro-legs pale greyish blue-green. Seven very delicate longitudinal lines of pale blue extend along the body, one being mid-dorsal and the three on each side placed (a) one dorsal the spiracle line, (b) one half way between the mid-dorsal line, and (a), and (c) one ventrad the spiracle line. Between the mid-dorsal line and (b) the body is soft green with a bluish cast. Between (a) and (b) extends a dark green stripe.

July 9, 1907. Larva 1½ inches long, and apparently about full grown. Head shiny yellow with one irregular dark mottled blotch on each lobe. Dorsal and dorso-lateral aspects mottled gray-brown. Ventral and ventro-lateral (to above the spiracle line) pale gray green. Legs pale.

The accompanying photograph (Plate XIII.) taken July [illegible] 1907, gives a good idea of the form of this larva and is also suggestive of its feeding habits.

The pupa, which is glistening brown, varies from 15 mm. to 19 mm. in length.

Types of the larvae and pupae are deposited in U. S. National Museum and in the collection of the Maine Agricultural Experiment Station.

* * *

Mr. August Busck has gone to England for the Summer to [illegible] on microlepidoptera with Lord Walsingham.

Mr. Erich Daecke of Philadelphia, is recovering from [illegible] and soon expects to go on with his explorations in New Jersey.

Bees of the genus Nomada, belonging to the group of N. depressa Cresson.

By T. D. A. Cockerell.

In 1863 (Proc. Ent. Soc. Phil.), Cresson described a female *Nomada* from Maine as *N. depressa*, characterized especially by the possession of a depressed velvety or pubescent area on the apex of the fifth abdominal segment, much after the manner of *Triepeolus*. Later, this insect was treated as a variety of *N. bisignata;* but it is not only a valid species, but perhaps deserving of subgeneric rank. It typifies a little group, of which four species are known, separable as follows:

Depressed area on fifth segment very broad; pygidial plate very broad; antennae entirely red, except a small black spot on scape above; mesothorax red, with one black band . . . . 1.

Depressed area much narrower, so that the space between it and the base of segment at sides is as great as or greater than width of of area . . . . 2.

1. Length about 8 mm.; wings reddish, darker apically, with a subapical hyaline patch; stigma clear ferruginous; third antennal joint distinctly shorter than fourth; second abdominal segment with a very large bright yellow patch on each side; third, fourth and fifth also each with a pair of yellow marks, growing successively smaller and closer together (Falls Church, Virginia, May 20, Nathan Banks) . . . . **N. depressicauda** n. sp.

Length about 9 mm.; wings dusky along the veins; stigma dark reddish; third antennal joint subequal with fourth; second abdominal segment with small and obscure yellow spots, the others without yellow (Mt. Hood, Oregon). . **N. hoodiana** Ckll., 1903.

2. "Length 8½ mm.; mesothorax light reddish-brown, with median longitudinal black stripe; metathorax red, with median black stripe, sides at base black; as much space between the flattened area and base of segment at sides as the area is wide" (Maine) . . . . **N. depressa** Cresson.

Length about 10 mm.; mesothorax dark red, with a black band; metathorax black, with six red spots, the upper pair in the enclosure, the middle pair rather obscure and more or less confluent with the upper; distinctly more space between the flattened area and base of segment at sides than area is wide (Lehigh Gap, Pa., June 30, Viereck) . . . . **N. skinneri** n. sp.

The last is the supposed *N. depressa* referred to in Proc. Phila. Acad., 1903, p. 608. I am greatly indebted to Dr.

Skinner and Mr. Fox for examining Cresson's type of N. *depressa*, and reporting the characters given above. All these insects have simple mandibles; Mr. Viereck kindly examined Cresson's type of *depressa* in respect to its mandibles some years ago.

N. depressicauda agrees with the description of *[illegible]* (Proc. Phila. Acad., 1903, p. 608) in practically every character except those given in the table. The third submarginal cell, however, is less narrowed above.

N. skinneri is quite a dark insect, with the middle of face and front (not involving the clypeus) black; flagellum strongly dusky, but clear red at extreme apex; third antennal joint a little shorter than fourth; second abdominal segment with a large yellow mark on each side, third with yellow dots; apical and basal margins of the segments infuscated; pygidial plate broad, but not so broad at apex as that of *N. depressicauda*; basal nervure going a moderate distance basad of t. m.

The type has the upper half of the second transverso-cubital wanting on both side.

Numerical Distribution of Some Insects.

By Owen Shoemaker Paxson, Devon, Pa

The following notes were compiled during the summer 1905, excepting in a very few instances as stated. In re[illegible]ing them, I walked a mile and a quarter from home to a se[illegible] pond and back again over the same route. Thus day a[illegible] day I confined myself almost exclusively to this ground. [illegible] consisted of about one-quarter mile of macadamized [illegible] five eighths of untilled fields and one-eighth of plowed [illegible] in corn, one-quarter in woods and the usual surroundings [illegible] a small pond on the edge of a copse.

I think the scarcity of some species in my list is a[illegible]countable by the fact of their comparative or almost [illegible]clusion in nature. The Coleoptera are represented so well [illegible] account of the fact that they are my favorite order, and consequently were pursued more closely and continuously. [illegible] here, however, there are many instances where their ways [illegible] surroundings have caused scanty records. The abundance in the Lepidoptera and Hymenoptera is explained by their prominent positions in the fields or woods, and the great ease in quickly and accurately distinguishing them. Many times the present number of species could have been tabulated, if I had been able to recognize them in their quick ways. Quantities were seen only for an instant or in the distance, and so lost forever.

In the succeeding pages such words as "several" and "numerous" are continually used. I explain their meaning so as to allow others to form a definite idea of the numerical superiority of some species over others. The first mentioned word will represent quantities of from four to twelve, while the latter will signify that the number of specimens ranged from thirteen upward.

COLEOPTERA.

Adalia bipunctata.—V, 17, three; V, 28, one; VI, 5, two, male and female, cop.; VI, 16, one; VIII, 11, do.

Anomoea laticlavia.—VI, 8, one; VII, 7, do.

Anthrenus scrophulariae.—V, 8, one; V, 10, two; V, 11, one; V, 13, two; V, 15, one; V, 16, do.

Aphodius inquinatus.—IV, 4, 1906, numerous.

Aphodius fossor.—IV, 25, one.

Attagenus piceus.—V, 28, one; VI, 5, three; VI, 11, one; VI, 13, do.

Calopteron reticulatum.—V, 29, one; VI, 1, do.; VI, 2, three; VI, 3, two; VI, 5, several; VI, 8, two; VI, 10, one; VI, 13, do.; VI, 16, do.; VII, 3, do.

Chauliognathus pennsylvanicus.—VI, 16, two, male and female; VI, 24, several, male and female, cop.; VI, 27, two; VII, 7, several; VIII, 19, one; VIII, 26, numerous, male and female, cop.; VIII, 31, do.; IX, 1, do.; IX, 3, do.; IX, 7, do.; IX, 8, numerous; IX, 12, numerous, male and female, cop.; IX, 18, do.; IX., 21, do.; IX, 23, do.; IX, 29, do.

Chelymorpha argus.—IV, 25, one; VI, 2, do.

Chlaenius aestivus.—VI, 9, one.

Chrysochus auratus.—VI, 24, one; VII, 14, several.

Chrysomela similis.—IV, 25, one; V, 16, do.

Cicindela sexguttata.—IV, 20, three; IV, 25, several; IV, 26, numerous; IV, 30, do.; V, 2, do.; V, 3, several; V, 7, numerous; V, 16, two; V, 21, several; V, 23, do.; V, 27, do.; V, 28, do.; V, 29, do.; VI, 2, do.; VI, 3, three; VI, 4, do.; VI, 5, numerous; VI, 6, several; VI, 9, one; VI, 10, two; VI, 14, several; VI, 15, two; VI, 16, one; VI, 17, do.; VI, 18, do.; VI, 21, two, male and female, cop.; VI, 22, one; VI, 28, two; VII, 5, one; VII, 17, do.

Cicindela punctulata.—VI, 25, one; VI, 27, do.; VI, 28, several; VII, 3, do.; VII, 4, numerous; VII, 5, do.; VII, 6, several; VII, 7, do.; VII, 12, numerous; VII, 14, several; VII, 15, numerous; VII, 17, do.; VII, 24, do.; VII, 27, do.; VIII, 4, several; VIII, 8, do.; VIII, 10, do.; VIII, 11, three; VIII, 14, do.; VIII, 17, several; VIII, 19, do.; VIII, 21, [illegible] VIII, 23, one; VIII, 26, three; VIII, 31, several; IX, [illegible] numerous; IX, 3, several, male and female, cop.; IX, [illegible] one; IX, 12, several; IX, 23, do.; IX, 26, numerous.

Crioceris asparagi.—V, 15, numerous, male and female; VI, 10, several; VI, 13, two; VI, 14, several; VI, 16, do.

Coccinella novemnotata.—V, 16, one; V, 19, several; V, 28, one; VI, 5, two, male and female, cop.; VI, 10, one; VI, 21, do.; VI, 24, do.; VII, 6, do.; VII, 7, two; VII, 15, one; VIII, 26, do.

Coccinella sanguinea.—VI, 24, one.

Desmocerus palliatus.—VII, 3, one.

Diabrotica vittata.—VI, 5, three, male and female; VI, 10, one.

Doryphora clivicollis.—VIII, 11, one.

Doryphora decemlineata.—V, 18, numerous; V, 20, several; VI, 1, two, male and female; VI, 2, one; VI, 10, several, male and female; VI, 13, numerous; VI, 28, do.

Elaphrus ruscarius.—V, 2, one.

Ellychnia corrusca.—IV, 25, one; V, 3, do.; V, 6, do.; V, [illegible] VI, 16, one.

Epicauta pennsylvanica.—VIII, 11, numerous; VIII, 19, three; VIII, 21, several; VIII, 26, do.; VIII, 31, numerous; IX, [illegible] IX, 3, do.; IX, 7, two; IX, 8, numerous; IX, 12, [illegible] male and female, cop.; IX, 23, two; IX, 26, one.

Euphoria inda.—IV, 9, one.

Gyrinus sinuatus.—IV, 27, numerous (seen often before); V, [illegible] numerous; VIII, 17, do.; VIII, 21, do.; IX, 1, do.; IX, [illegible] do.; IX, 18, do.; IX, 21, do.; IX, 23, do.; IX, 26, do.

Harpalus caliginosus.—IX, 3, several; IX, 6, do.; IX, 7, three; IX, [illegible] two, male and female, cop.

Hippodamia parenthesis.—VI, 5, one; VI, 20, do.

Hister abbreviatus.—IV, 30, several.

Hister americanus.—IV, 30, several.

Lachnosterna fusca.—IV, 28, numerous; IV, 30, one; V, 6, numerous; V, 8, two; V, 10, several; V, 13, numerous; V, 14, do.; 15, do.

ophus cingulatus.—IV, 25, one; V, 3, numerous, male and female; V, 7, do.; VI, 24, one.

us griseus.—IV, 30, one.

actylus subspinosus.—VI, 2, one; VI, 3, three, male and female; VI, 6, several, male and female; VI, 9, three, male and female; VI, 10, several, male and female; VI, 11, three; VI, 13, several, male and female, cop.; VI, 14, do.; VI, 16, one; VI, 17, do.; VI, 19, several; VI, 22, several, male and female; VI, 23, do.; VI, 24, numerous, male and female, cop.; VI, 28, do.

maculata.—V, 6, two; V, 7, several; VI, 21, one; VII, 6, three; VII, 7, two.

tes piceus.—VI, 5, one.

maroides.—VI, 13, one.

s pennsylvanica.—VI, 9, one; VI, 10, do.; VI, 22, two; VI, 23, one; VI, 24, do.; VI, 28, do.; VII, 3, two; VII, 7, three.

s marginellus.—VI, 6, numerous; VI, 10, do.

chus lucublandus.—V, 29, one; VI, 5, do.

chus stygicus.—IV, 14, 1906, one.

subterraneus.—VI, 15, one; VI, 17, do.

mericana.—VII, 6, one, male.

inaequalis.—V, 3, numerous, male and female; V, 7, several, male and female.

noveboracensis.—VII, 6, several.

rus carolinus.—V. 30, several; VI, 1, numerous; VI, 4, do.; VI, 6, do.; VI, 8, do.; VI, 9, do.; VI, 10, do.; VI, 11, two; VI, 13, three; VI, 16, do.; VI, 24, two; VI, 28, one.

o tenebrioides.—VI, 28, two.

es tetraophthalmus.—VI, 23, one; VI, 24, several; VI, 25, several, male and female, cop.; VI, 27, two; VI, 28, several, male and female, cop.; VII, 7, numerous, male and female, cop.; VII, 14, two; VII, 15, do.; VII, 27, several, male and female, cop.; VIII, 1, three, male and female, cop.; VIII, 4, two; VIII, 14, do.

ernus humeralis.—VI, 16, one.

ORTHOPTERA.

ira carolina.—VII, 11, three; VII, 12, several; VII, 14, do.; VII, 15, do.; VII, 17, do.; VII, 24, numerous; VII, 27, several; VIII, 1, do.; VIII, 4, numerous; VIII, 8, several; VIII, 10, do.; VIII, 11, numerous; VIII, 14, several; VIII, 17, do.; VIII, 19, numerous; VIII, 21, several; VIII, 23, numerous; VIII, 26, do.; VIII, 31, several; IX, 1, numerous; male and female, cop.; IX, 3, several; IX, 7, two; IX, 8, several; IX, 12, do.; IX, 18, numerous; IX, 21, do.; IX, 23, do.; IX, 29, do.

Gryllus pennsylvanicus.—V, 28, two; VIII, 17, do.; VIII, 19, do.; VIII, 26, do.; VIII, 31, several; IX, 1, three; IX, 3, do.; IX, 7, two; IX, 8, one; IX, 12, numerous; IX, 18, do.; IX, 21, do.; IX, 23, do.; IX, 29, do.

Melanoplus femoratus.—VIII, 21, two.

Melanoplus femur-rubrum.—VIII, 21, numerous; VIII, 26, do.; VIII, 31, do.; IX, 1, do.; IX, 3, do.; IX 7, do.; IX, 8, do.; IX, 12, do.; IX, 18, do.; IX, 21, do.; IX, 23, do.; IX, [illegible] do.; IX, 29, do.

Nemobius fasciatus.—VII, 13, three; VII, 14, several; VII, 27, numerous; VIII, 19, do.; VIII, 23, do.; VIII, 26, do.; VIII, 31, do.; IX, 1, do.; IX, 3, do.; IX, 7, do.; IX, 8, do.; IX, 12, do.; IX, 18, do.; IX, 21, do.; IX, 23, do.; IX, 29, do.

Scudderia curvicauda.—VIII, 17, two; VIII, 19, one; VIII, [illegible] two; VIII, 23, three; VIII, 26, two; VIII, 31, three; IX, 1, one; IX, 8, several; IX, 12, two; IX, 23, one; IX, [illegible] three.

LEPIDOPTERA RHOPALOCERA.

Argynnis cybele.—VI, 4, several; VI, 5, two; VI, 9, do.; VI, [illegible] several; VI, 11, one; VI, 13, three; VI, 14, numerous; VI, 15, several; VI, 16, numerous; VI, 17, several; VI, 18, do.; VI, 19, do.; VI, 21, do.; VI, 22, do.; VI, 23, do.; VI, [illegible] do.; VI, 27, three; VI, 28, numerous; VII, 3, several; VII, 4, three; VII, 5, do.; VII, 6, two; VII, 7, three; VII, [illegible] two; VII, 14, several; VII, 15, three; VII, 17, one; VII, 24, two; VIII, 1, one; VIII, 4, do.; VIII, 11, [illegible] VIII, 17, three; VIII, 19, do.; VIII, 21, one; VIII, [illegible] several; VIII, 26, two; VIII, 31, several; IX, 1, three; IX, [illegible] IX, 7, one; IX, 8, several; IX, 12, do.; IX, 18, one; IX, 21, do.; IX, 23, two; IX, 29, several.

Argynnis idalia.—VI, 13, one male; VI, 15, do.; VI, 17, one; VI, [illegible] do.; VI, 19, several; VI, 21, do.; VI, 22, several male and female; VI, 23, several; VI, 24, one; VI, 25, numerous; VI, 27, do.; VI, 28, do.; VII, 3, do.; VII, 4, several; VII, 5, do.; VII, 6, several, male and female; VII, 7, [illegible] VII, 12, two; VII, 14, several; VII, 15, do.; VII, 17, [illegible] VII, 24, three; VII, 27, one; VIII, 1, do.; VIII, 11, [illegible] VIII, 17, one; VIII, 19, several; VIII, 23, do.; VIII, [illegible] VIII, 31, one; IX, 1, two; IX, 3, several; IX, 7, [illegible] IX, 8, several; IX, 12, two; IX, 18, one; IX, 21, two; IX, [illegible] one; IX, 29, three.

Argynnis myrina.—VI, 6, two; VI, 16, do.; VI, 19, several; VI, [illegible] one; VII, 14, do.; VII, 24, two; VII, 27, do.; VIII, [illegible] VIII, 4, do.; VIII, 31, two; IX, 1, do.; IX, 3, several; IX, 18, two; IX, 21, three.

phanus hypophlaeas.—V, 19, one; VI, 24, do.; VI, 25, do.; VI, 27, several; VI, 28, numerous; VII, 3, two; VII, 4, several; VII, 6, three; VII, 7, several; VII, 12, do.; VII, 14, two; VII, 15, numerous; VIII, 14, one; VIII, 17, two; VIII, 19, several; VIII, 21, two; VIII, 26, do.

philodice.—IV, 25, one; IV, 26, do.; IV, 28, two; IV, 30, three; V, 2, several; V, 3, one; V, 6, two; V, 7, numerous; V, 11, several; V, 15, numerous; V, 16, do.; V, 21, three; V, 23, do.; V, 27, do.; V, 28, numerous; V, 29, several; VI, 2, do.; VI, 3, two; VI, 5, several; VI, 6, do.; VI, 8, two; VI, 9, one; VI, 10, several, female; VI, 11, three; VI, 14, two; VI, 15, do.; VI, 16, do.; VI, 17, several; VI, 18, two; VI, 19, do.; VI, 21, numerous; VI, 22, do.; VI, 23, do.; VI, 24, several; VI, 25, numerous; VI, 27, do.; VI, 28, do.; VII, 3, numerous, male and female; VII, 4, numerous; VII, 5, do.; VII, 6, do.; VII, 7, do.; VII, 12, do.; VII, 14, do.; VII, 15, do.; VII, 24, several; VII, 27, do.; VIII, 1, do.; VIII, 4, numerous; VIII, 8, do.; VIII, 10, several; VIII, 11, numerous; VIII, 14, several; VIII, 17, numerous; VIII, 19, do.; VIII, 21, do.; VIII, 23, do.; VIII, 26, do.; VIII, 31, several; IX, 1, numerous; IX, 3, do.; IX, 7, numerous, male and female, cop.; IX, 8, numerous; IX, 12, do.; IX, 18, do.; IX, 21, do.; IX, 23, do.; IX, 29, do.

plexippus.—V, 11, one; V, 18, do.; V, 19, do.; V, 28, do.; VI, 2, two; VI, 5, one; VI, 13, do.; VI, 14, do.; VI, 16, do.; VI, 17, three; VI, 19, one; VI, 23, two; VI, 25, one; VI, 27, three, male and female, cop.; VI, 28, two; VII, 3, one; VII, 6, three; VII, 7, several; VII, 12, do.; VII, 14, do.; VII, 15, one; VII, 24, two; VII, 27, do.; VIII, 11, do.; VIII, 21, one; VIII, 31, do.; IX, 3, two males; IX, 7, three; IX, 8, several; IX, 12, do.; IX, 18, two; IX, 21, do.; IX, 23, one; IX, 29, two.

us pylades.—IV, 30, two; VI, 2, several; VI, 5, one; VI, 6, two, male and female; VI, 8, one; VI, 10, do.; VI, 11, several; VI, 13, three; VI, 14, one; VI, 15, several; VI, 16, do.; VI, 18, one; VI, 21, three; VI, 22, two; VI, 23, do.; VI, 24, do.; VI, 28, do.; VII, 3, one.

us tityrus.—V, 13, one; V, 14, do.; V, 15, three; V, 27, one; V, 28, two; V, 29, several; VI, 2, do.; VI, 4, two; VI, 5, several; VI, 6, three; VI, 8, several; VI, 9, two; VI, 10, one; VI, 13, three; VI, 14, two; VI, 15, do.; VI, 16, three; VI, 17, one; VI, 18, two; VI, 19, three; VI, 21, two; VI, 22, several; VI, 23, one; VI, 25, three; VI, 27, one; VI, 28, several; VII, 3, two; VII, 12, do.; VII, 14, several; VII, 15, two; VII, 24, one; VIII, 4, do.; VIII, 10, do.; VIII, 11, two; VIII, 26, one.

Eurema euterpe.—IX, 7, several; IX, 8, one.

Eurema nicippe.—IX, 12, one male; IX, 23, two males.

Grapta interrogationis.—VI, 25, two; VI, 27, three; VI, 28, one; V
26, do.; IX, 1, do.; IX, 7, do.

Grapta interrogationis umbrosia.—VII, 2, two; VII, 3, do.; VII
three; VII, 6, one; VII, 12, do.; VII, 15, two; VII,
one; VIII, 11, do.; VIII, 14, do.

Hesperia tessellata.—VII, 14, one.

Junonia coenia.—VII, 7, one; VII, 9, do.; VII, 12, do.; VII, 14, th

Limenitis archippus.—VI, 8, one; VI, 10, do.; VII, 13, do.; VII,
do.; VII, 15, do.; VII, 24, do.; VII, 27, do.; VIII, 8,
eral, male and female; VIII, 10, one; VIII, 11, do.; V
17, three; VIII, 31, one; IX, 3, do.; IX, 8, two; IX,
one; IX, 18, two; IX, 21, several; IX, 23, one; IX, 26,

Lycaena comyntas.—V, 2, one male; V, 16, three; V, 29, one;
5, do.; VI, 22, several; VI, 23, do.; VI, 24, two; VI,
numerous; VI, 25, two; VI, 27, three; VI, 28, several,
and female; VII, 3, numerous; VII, 4, one; VII, 5,
VII, 6, several, male and female; VII, 7, several; VII,
three males; VII, 14, three, male and female; VII, 15,
eral; VII, 24, three; VII, 27, several; VIII, 1, do.; V
4, do.; VIII, 8, one; VIII, 10, several; VIII, 11, two; V
14, do.; VIII, 17, several; VIII, 19, do.; VIII, 23, th
VIII, 26, two; IX, 1, several; IX, 3, two; IX, 12, do.

Lycaena pseudargiolus.—IV, 9, two males; IV, 10, several males,
11, do.; IV, 15, one male; IV, 20, several males; IV
one male; IV, 24, two males; IV, 25, several males,
28, two males; IV, 30, three males; V, 2, two males
7, one; VI, 9, one female; VI, 11, one; VI, 13, three,
and female; VI, 14, several females; VI, 15, two fema
VI, 16, three; VI, 21, one; VI, 24, do.

Melitaea phaeton.—VI, 15, two; VI, 17, one; VI, 21, do.

Pamphila egeremet.—VI, 5, one.

Pamphila hobomok.—V, 28, three; V, 29, numerous, male and fem
VI, 5, several, male; VI, 6, three, male and female; V
several males; VI, 10, two, male and female; VI,
females; VI, 14, three; VI, 22, two; VI, 23, one; VII
one male.

Pamphila peckius.—V, 16, one; VI, 2, one female; VI, 6, two; V
two, male and female, cop.

Papilio philenor.—VI, 17, one female; VIII, 11, one.

Papilio polyxenes.—V, 16, one male; V, 23, two males; V,
males; V, 28, numerous; V, 29, numerous, male and fem
VI, 6, do.; VI, 8, several, male and female; VI, 9,
VI, 10, several males; VI, 11, do.; VI, 13, several; VI,

several males; VI, 15, numerous, male and female; VI, 16, do.; VI, 17, several, male and female; VI, 18, do; VI, 19, do.; VI, 21, do.; VI, 22, do.; VI, 23, do.; VI, 24, three, male and female; VI, 25, several, male and female; VI, 27, three, male and female; VI, 28, do.; VII, 4, do.; VII, 6, one female; VII, 7, one male; VII, 12, two males; VII, 14, do.; VII, 17, several, male and female; VII, 24, two males; VII, 27, several males; VIII, 1, two males; VIII, 4, three, male and female; VIII, 8, several, male and female; VIII, 10, two males; VIII, 11, numerous, male and female; VIII, 14, one female; VIII, 17, several, male and female; VIII, 19, one female; VIII, 21, several, male and female; VIII, 23, do.; VIII, 26, do.; VIII, 31, two, male and female; IX, 1, do.; IX, 8, three, male and female; IX, 12, one male; IX, 23, two males; IX, 26, one male.

ilio troilus.—V, 10, one male; V, 16, several, male and female; V, 18, one male; V, 22, do.; V, 26, one female; V, 28, three males; V, 29, do.; VI, 2, two males; VI, 9, one male, VI, 23, do.; VI, 28, one; VII, 14, one male; VII, 17, one female; VII, 19, several, male and female; VII, 24, three, male and female; VII, 27, two males; VIII, 4, three males; VIII, 8, two males; VIII, 10, several, males; VIII, 11, several; VIII, 14, one male; VIII, 17, two males; VIII, 19, several; VIII, 23, one; VIII, 26, several; VIII, 31, two; IX, 1, three; IX, 3, two; IX, 7, one; IX, 8, one female.

ilio turnus.—IV, 25, one; IV, 28, do.; V, 2, one female; V, 3, do.; V, 4, do.; V, 7, three; V, 14, one; V, 15, two; V, 16, several; V, 17, one female; V, 21, do.; V, 23, three; V, 27, several males; V, 28, numerous males; V, 29, do.; VI, 1, several, male and female (one black form); VI, 2, several, male and female; VI, 3, several; VI, 4, numerous; VI, 5, several males; VI, 6, several, male and female; VI, 8, several; VI, 9, do.; VI, 10, do.; VI, 11, do.; VI, 13, numerous; VI, 14, do.; VI, 15, two; VI, 16 (one black form), one male; VI, 17, several; VI, 18, two females; VI, 19, two; VI, 21, several; VI, 22, do.; VI, 23, do.; VI, 24, (one black form); VI, 25, two, (one black form); VII, 4, one; VII, 5, do.; VII, 17, do.; VII, 24, do.; VII, 27, two; VIII, 1, do.; VIII, 4, one; VIII, 8, three; VIII, 10, do.; VIII, 11, several, male and female; VIII, 17, three; VIII, 19, several, male and female (two black forms); VIII, 23, three; VIII, 26, several, male and female, (two black forms); VIII, 31, two, male and female, (one black form); IX, 1, do.; IX, 3, one; IX, 7 (one black form); IX, 8, do.

Phyciodes tharos.—V, 16, one; V, 28, two; V, 29, do.; VI, 23, do.; VI, 24, one male; VI, 25, three; VI, 27, do.; VI, 28, numerous, male and female; VII, 3, numerous; VII, 4, do.; VII, 5, three; VII, 6, numerous; VII, 7, do.; VII, 12, do.; VII, 14, do.; VII, 15, do.; VII, 24, several; VII, 27, two; VIII, 1, do.; VIII, 10, three; VIII, 11, several; VIII, 17, numerous; VIII, 19, do.; VIII, 21, several; VIII, 23, numerous; VIII, 26, do.; VIII, 31, do.; IX, 1, do.; IX, 3, numerous, male and female, cop.; IX, 7, numerous; IX, 8, do.; IX, 12, do.; IX, 18, do.; IX, 21, several; IX, 23, numerous; IX, 29, do.

Pieris rapae.—IV, 10, one; IV, 11, do.; IV, 15, three; IV, 20, two; IV, 22, one; IV, 24, do.; IV, 25, numerous; IV, 26, one; IV, 28, several; IV, 30, numerous; V, 2, several; V, 3, do.; V, 4, one; V, 6, several; V, 7, do.; V, 11, do.; V, 16, do.; V, 27, two; V, 29, one; VI, 5, do.; VI, 10, do.; VI, 13, do.; VI, 15, three; VI, 16, two; VI, 17, do.; VI, 18, one; VI, 23, three; VI, 27, two; VI, 28, three; VII, 12, do.; VII, 14, two; VII, 15, do.; VII, 27, do.; VIII, 1, one; VIII, 4, do.; VIII, 11, do.; VIII, 17, three; VIII, 19, one; VII, 21, one; IX, 12, two; IX, 23, three; IX, 26, two; IX, 29, one.

Pholisora catullus.—VII, 7, one; VII, 12, do.; VII, 14, three; VII, 15, do.; VIII, 11, two.

Polygonia comma comma.—IV, 11, two, male and female, cop.; IV, 24, two; IV, 25, one; V, 3, two, male and female; VI, [illegible], one.

Pyrameis atalanta.—V, 29, two; VI, 2, one; VI, 5, do.; VI, 8, [illegible]; VI, 9, do.; VI, 10, several; VI, 11, two; VI, 15, one; VI, 17, do.; VI, 22, three; VII, 4, two; VII, 27, one; IX, [illegible], do.; IX, 23, three; IX, 26, two.

Pyrameis cardui.—VI, 16, one; VI, 27, do.; VII, 3, do.; VII, 4, [illegible]; VII, 14, two; VIII, 1, one; VIII, 4, two; VIII, 8, one; VIII, 10, two; VIII, 11, one; VIII, 14, two; VIII, 16, three; VIII, 21, two; IX, 3, one; IX, 8, two; IX, 12, [illegible]; IX, 18, three; IX, 21, one; IX, 23, two; IX, 26, one.

Pyrameis huntera.—V, 16, two; VI, 8, several; VI, 9, three; VI, [illegible], one; VI, 21, do.; VI, 22, do.; VII, 17, two; VII, 27, several.

Satyrus alope.—VI, 24, two; VI, 25, three; VI, 27, one; VI, 28, several; VII, 3, three; VII, 4, several; VII, 5, do.; VII, 6, several, male and female; VII, 7, several; VII, 12, numerous; VII, 14, several; VII, 15, two; VII, 17, do.; VII, [illegible], one female; VIII, 10, two; VIII, 14, one.

os juvenalis petronius.—V, 2, several; V, 3, do.; V, 23, one; VI, 10, two males.

sa antiopa.—III, 18, numerous; III, 20, several; III, 26, do.; IV, 2, do.; IV, 9, do.; IV, 11, do.; IV, 15, one; IV, 20, several; IV, 24, three; IV, 25, several; IV, 28, two; IV, 30, do.; V, 2, one; VI, 9, two; VI, 21, one; VI, 25, do.; VI. 28, two; VII, 3, do.; VII, 4, do.; VII, 7, do.; VII, 12, do.; VII, 27, one; VIII, 26, three; IX, 8, one; IX, 12, two; IX, 23, three; IX, 29, do.

LEPIDOPTERA HETEROCERA.

luna.—IV, 25, one female; VII, 28, one male.

lophaga myron.—V, 16, one.

us angulifera.—V, 9, one female.

eris io.—VI, 6, two males; VI, 9, one female; VII, 4, do.

ia albovittata.—V, 22, one; V, 29, do.; VI, 2, several; VI, 5, do.; VI, 9, two; VI, 10, several; VI, 13, two; VI, 14, three; VI, 17, one; VII, 15, two; VII, 24, one; VII, 27, do; VIII, 4, do.

capsa pomonella.—V, 11, one.

ris thysbe.—V, 29, one.

cecropia.— VI, 4, one female.

oma virginica.—V, 2, one.

polyphemus.—V, 14, one; VI, 5, one male; VI, 16, one; VI, 17, two males; VI, 18, one female; VI, 23, one; VII, 10, one female.

bisselliella.—IV, 17, one (seen previous); IV, 19, two; V, 8, one; V, 12, do.; V, 13, do.; V, 14, two; V, 15, several; V, 16, two; V, 17, one; V, 21, do.; V, 22, do.; V, 23, do.; V, 29, do.; V, 30, do.; VI, 3, do.; VI, 4, two; VI, 6, one; VI, 13, two; VI, 21, one; VII, 28, two; VIII, 6, one; VIII, 10, do.

risa bella.—VII, 14, one; VII, 21, two; VIII, 23, one; IX, 3, do.; IX, 12, do.

HYMENOPTERA.

mellifica.—V, 29, numerous; VI, 28, one; VII, 6, two; VII, 7, several; VII, 12, numerous; VII, 14, several; VIII, 1, three; VIII, 10, do.; VIII, 19, several; VIII, 23, one; IX, 7, two; IX, 12, several; IX, 18, numerous; IX, 21, do.; IX, 23, several; IX, 26, do.; IX, 29, three.

us americanorum.—V, 28, several; V, 29, two; VI, 5, do.; VI, 9, one; VI, 16, do.; VII, 6, do.; VII, 12, do.; VIII, 23, do.; VIII, 31, two; IX, 1, several; IX, 3, do.

Bombus pennsylvanicus.—V, 3, one; V, 11, do.; V, 16, several; V, 17, do.; V, 19, do.; V, 28, numerous; V, 29, several; VI, 2, one; VI, 4, do.; VI, 11, two; VI, 14, one; VI, 16, do.; VIII, 26, do.; IX, 1, several; IX, 3, three; IX, 7, one; IX, 12, three; IX, 18, two; IX, 21, three; IX, 23, do.; IX, 30, two.

Bombus virginicus.—IV, 25, three; IV, 26, several; IV, 30, three; V, 2, several; V, 3, one; V, 5, do.; V, 6, several; V, 7, three; V, 14, do.; V, 15, several; V, 16, do.; V, 17, numerous; V, 19, several; V, 28, numerous; V, 29, several; VI, 1, do.; VI, 2, do.; VI, 3, three; VI, 4, do.; VI, 5, several; VI, [illegible] three; VI, 8, two; VI, 9, three; VI, 10, several; VI, 11, three; VI, 14, several; VI, 15, two; VI, 16, one; VI, 17, [illegible] VI, 18, do.; VI, 21, three; VI, 22, one; VI, 24, two; VI, 28, one; VII, 6, two; VIII, 4, one; VIII, 10, two; IX, 1, three; IX, 18, one; IX, 21, two; IX, 23, one; IX, 30, two.

Camponotus herculaneus.—V, 3, numerous, neuters.

Camponotus pennsylvanicus.—IV, 14, 1906, several.

Cerceris fumipennis.—VII, 15, two; VII, 24, one.

Chalybion caeruleum.—VI, 24, one; VI, 25, do.; VII, 15, do.

Dolerus bicolor.—V, 19, one.

Isodontia tibialis.—VII, 15, one.

Monobia quadridens.—VII, 15, one.

Myzine sexcincta—VII, 15, one; VII, 24, do.

Pelecinus polyturator.—IX, 6, three; IX, 7, one; IX, 8, two.

Polistes metricus.—IV, 25, three (seen often before), IV, 28, two; IV, 30, one; V, 3, two; V, 7, several; V, 9, do.; V, 11, [illegible] V, 15, do.; V, 20, three; V, 30, three; VI, 5, one; VI, [illegible] do.; VI, 16, two; VII, 14, do.; VII, 24, one; VIII, 4, [illegible] VIII, 10, two; VIII, 14, one; VIII, 17, do.; VIII, 20, three; IX, 1, two.

Tiphia inornata.—VI, 5, one.

Trogus exesorius.—V, 20, one; VI, 2, three; VI, 5, several; VI, [illegible] do.; VI, 10, one; VI, 13, several; VI, 14, three; VI, [illegible] several; VI, 17, do.; VI, 18, one; VI, 23, do.; VI, [illegible] three; VI, 28, two; VIII, 17, one; VIII, 19, two; VIII, [illegible] do.; IX, 1, one.

Vespa germanica.—V, 2, one; V, 3, two females; V, 6, one; V, [illegible] three; VI, 3, one; VI, 4, two; VI, 10, three; VI, 17, one; VIII, 10, do.; VIII, 20, several; IX, 1, three.

Vespa maculata.—V, 7, three; V, 28, one; VI, 2, two; VI, 6, one; VI, 10, do.; VI, 18, do.; VIII, 4, several; VIII, 10, do.; VIII, 23, three; VIII, 20, do.; IX, 1, several.

Xylocopa virginica.—V, 3, two; V, 4, one; V, 6, do.; V, 11, several; V, 20, one; V, 30, one; VI, 2, two; VIII, 4, one; VIII, 8, do.; VIII, 10, do.

ODONATA.

nax junius.—IV, 11, one; V, 28, several; V, 29, do.; VI, 2, do.; VI, 5, several, male and female; VI, 9, several; VI, 10, two, male and female; VI, 15, several, male and female; VI, 16, several; VI, 17, three; VI, 22, several; VI, 23, three, male and female; VII, 3, several, male and female; VII, 4, numerous, male and female; VII, 6, several, male and female; VII, 7, do.; VII, 12, several males; VII, 14, several, male and female; VII, 15, three males; VII, 24, do.; VII, 27, several males; VIII, 1, three males; VIII, 4, one; VIII, 8, several males; VIII, 10, three males; VIII, 11, several; VIII, 23, two; IX, 8, one female.

alopteryx maculata.—V, 28, one male; V, 29, one female; VI, 1, one male; VI, 2, several, male and female; VI, 4, three, male and female; VI, 5, do.; VI, 6, several, male and female; VI, 8, three, male and female; VI, 9, do.; VI, 10, numerous, male and female; VI, 11, several, male and female; VI, 13, two; VI, 14, several, male and female; VI, 15, several males; VI, 16, several, male and female; VI, 17, do.; VI, 18, do.; VI, 19, do.; VI, 22, two males; VI, 25, three, male and female; VI, 27, several; VI, 28, several, male and female, cop.; VII, 3, several, male and female; VII, 6, several males; VII, 7, several, male and female; VII, 15, one male.

bellula luctuosa.—VII, 4, several; VII, 14, one; VII, 15, two; VII, 27, one.

bellula pulchella.—VI, 5, several; VI, 8, two; VI, 9, several, male and female; VI, 13, do.; VI, 14, do.; VI, 15, three, male and female; VI, 16, do.; VI, 17, several, male and female; VI, 19, two males; VI, 22, two; VI, 23, several, male and female; VI, 24, two females; VI, 25, several, male and female; VI, 27, one female; VI, 28, do.; VII, 3 several, male and female; VII, 4, several males; VII, 6, two females; VII, 7, several, male and female; VII, 12, two, male and female; VII, 14, two males; VII, 15, three males; VII, 24, two males;; VII, 27, do.; VIII, 8, one male; VIII, 11, two males.

athemis lydia.—V, 16, one female; V, 29, several, male and female; VI, 2, one female; VI, 5, several, male and female; VI, 8, do.; VI, 10, three females; VI, 11, do.; VI, 13, several, male and female; VI, 14, do.; VI, 15, three males; VI, 16, several, male and female; VI, 17, two, male and female.. VI, 18, do.; VI, 19, three males; VI, 22, three, male and female; VI, 23, two males; VI, 25, three males; VI, 27, several, male and female; VI, 28, three, male and female; VII, 3, several; VII, 4, several males; VII, 6, two males; VII, 7, several, male and female; VII, 12, several; VII, 14, two, male and female; VII, 15, several, male and female; VII, 24, do.; VII, 27, several males; VIII, 1, two, male and female; VIII, 4, two males; VIII, 10, two females; VIII, 11, two males; VIII, 17, two, male and female.

HEMIPTERA.

Cicada tibicen.—VII, 9, one; VII, 10, do.; VII, 12, do.; VII, 15, several; VIII, 10, do.; VIII, 17, do.; VIII, 19, three; VIII, 26, several; IX, 3, do.

Euchistus variolarius.—VII, 3, one.

Hygrotrechus remegis.—IV, 10, numerous; IV, 27, do.; V, 28, do.; VI, 9, do.; VI, 14, do.; VIII, 17, several; VIII, 23, numerous; IX, 1, several; IX, 12, do.; IX, 18, do.; IX, 21, do.; IX, 23, three; IX, 26, two.

Leptopterna dolobrata.—VI, 10, one; VI, 11, two.

Nezara hilaris.—IV, 25, one; VI, 14, do.

Poeciloptera septentrionalis.—VI, 25, one.

DIPTERA.

Bittacomorpha clavipes.—V, 4, numerous; V, 5, do.; V, 6, do.; V, 7, do.; V, 28, one; VI, 14, two, male and female, cop.

Chrysopila thoracica.—V, 28, one; V, 29, several; VI, 1, three; VI, 2, several; VI, 3, three; VI, 4, one; VI, 6, several; VI, 10, two; VI, 11, one; VI, 13, two; VI, 14, one; VI, 17, do.

Chrysops niger.—V, 28, several; V, 29, numerous; VI, 2, do.; VI, [illegible] do.; VI, 6, do.; VI, 8, three; VI, 9, several; VI, 10, numerous; VI, 11, two; VI, 13, several; VI, 14, numerous; VI, 15, several; VI, 16, numerous; VI, 17, several; VI, [illegible] do.; VI, 19, numerous; VI, 21, several; VI, 22, do.; VI, 23, do.; VI, 24, numerous; VI, 25, several; VI, 27, [illegible] VI, 28, do.; VII, 3, numerous; VII, 5, do.; VII, 6, [illegible] VII, 7, do.; VII, 12, do.; VII, 14, do.; VII, 15, several; VII, 24, do.; VII, 27, one; VIII, 1, do.; VIII, 4, several; VIII, 8, three; VIII, 10, two; VIII, 11, one.

Eristalis tenax.—VI, 24, one; VII, 15, do.; IX, 18, several; IX, [illegible] two; IX, 23, three; IX, 26, do.

Eristalis transversus.—VII, 15, one; IX, 18, several; IX, 21, one; IX, 23, three; IX, 26, two.

Musca domestica.—IV, 27, one; IV, 29, do.; V, 28, several; V, [illegible] VI, 5, numerous, male and female; VI, 13, several; VI, 14, numerous; VI, 16, several; VI, 18, numerous; VII, 24, do.; VIII, 15, do.; IX, 1, do.; IX, 23, do.; IX, 29, several.

Simulium innoxium.—V, 5, numerous; V, 29, several.

Tabanus lineola.—VI, 15, one; VII, 15, several.

Tritoxa flexa.—VI, 11, two, male and female, cop.; VI, 16, one; VI, 23, two, male and female, cop.; VI, 24, one; VI, 28, do.; VII, 12, do.

NEUROPTERA.

Chrysopa oculata.—VIII, 4, one.

◆

WARNING.—Collectors looking for foreign exchange should be on their guard against certain unscrupulous dealers, who seem to be in business for the purpose of victimizing the unwary. One of the worst offenders of this sort is located at Berlin, Germany and I will cheerfully furnish the name of this shark to anybody so requesting. This is his modus operandi: After carefully scanning the advertiser's list of an entomological publication and having found an ad. to his liking, he then proceeds to send the advertiser an interesting catalogue and card, stating that he can use at least fifty specimens of every species occurring in that locality and offers in exchange, value for value, specimens from all parts of the world. The collector happy in the thought of having found an opportunity for interesting additions, now sends a trial package, but fails to get either exchange or letter in return. After months of patient waiting, during which time he has sent several requests to the dealer for the exchange due him, without even securing the courtesy of a reply, he, (the package having been registered) has recourse to the foreign Post Office to which the package was sent. This office will in due time inform him that the package in question arrived and was promptly delivered to the addressee. This document, may however have been preceded by several days by a letter from the dealer himself, who, having been aroused from his artful slumber by the inquiry to the Postal authorities, now expresses his "allergrösste" surprise at the collector's seeming failure of having received his exchange, which had been sent immediately upon receipt and inspection of the package, but was "not registered." He will add there had never been reported to him a miscarriage of the goods he shipped, notwithstanding the fact that he never registered a package. He will conclude by expressing his satisfaction with the collector's goods and many many regrets. Of course, these suave words are far from consoling the collector, who feels he has been duped. He may now resort to threats of exposure, whereupon the dealer informs him that he has witnesses to the fact that a package containing correct value in foreign specimens, was duly mailed to the collector; however not wishing to have the collector lose all he has mailed him a box of interesting things. This box will eventually be received by the collector and on opening be found to contain a few common diptera, coleoptera and noctuae, which the dealer has no doubt obtained without even leaving his doorsteps or garden.—AUG. KNETZGER, 3822 McDonald Av., St. Louis, Mo.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JULY, 1908.

We shall be glad to learn what the universities and colleges of the United States are doing in the way of teaching entomology, and if the information is sent to us tersely and briefly stated, we will publish it. We hold that the study of entomology is so important in many ways that its neglect by large institutions of learning shows short-sightedness and benightedness. This is particularly true of medical colleges.

We append a statement of the course given by the Graduate School of the University of Illinois under Prof. S. A. Forbes and Dr. J. W. Folsom.

GENERAL ENTOMOLOGY.—This course and Entomology form a year's connected major work in entomology, covering substantially the whole field. The present course is devoted mainly to field entomology in the fall and later to the morphological and physiological aspects of the subject. Beginning with the collection and preservation of specimens and the making of field observations, it is continued by laboratory studies of typical insects, made with special reference to the recognition of adaptive structures, and experimental work intended to determine their exact utilities.

GENERAL ENTOMOLOGY.—To be taken either with or without the preceding course. The classification and determination of insects, the study of life histories in the insectary and by field observations, and the collection of information with respect to the ecological relations of insects, are the principal objects of this course.

ADVANCED ENTOMOLOGY.—Under this head students desiring advanced work in entomology, especially as a preparation for thesis work in this subject, will be individually provided for on consultawith the entomological instructors. The course may be made to cover one or two semesters and to earn a three-hour or a five-hour credit in each. At least a three-hour course for one semester will be required as a preparation for entomological thesis work.

SYSTEMATIC ENTOMOLOGY.—This course, while primarily entomological, is designed to be of general use to students of biology. The lectures include a historical and critical survey of the systems of classification; a discussion of the aims and methods of classification; the nature of species, genera, and other groups, and the rules of nomenclature; the preparation of taxonomic articles, involving the study of bibliography, synonymy, analytical keys, etc. These subjects receive practical treatment in the laboratory, and to qualified students the unworked material of the State Laboratory of Natural History is available for study.

Entomological Literature.

THE GENERA OF THE TORTRICIDAE AND THEIR TYPES. By C. H. Fernald, A. M., Ph.D. Published by the Author.

This paper is the culmination of twenty years of work on this family of Microlepidoptera. It shows diligent and profound research into the literature of the subject. The synonomy of the genera is given. There has been much additional interest in the micro-moths in recent years and a work like this will be invaluable to future students.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE next number of this Journal (No. 8) will appear October first, August and September being omitted.

A YOUNG son of Mr. and Mrs. Thomas E. Greenwood, residing at 111 Sprague street, in this city, has been troubled for some time with ear ache and pains in the head, which were ascribed to neuralgia.

Recently Mrs. Greenwood, following instructions found in a medical book, dropped a few drops of sweet oil in the lad's ear. Within a short time the boy's ear began itching in a distressing manner, and a little later a live potato bug came out of the ear.

It is believed that the bug found lodgment in the ear when the boy was playing on the grass some time last summer, as he has been troubled with his ear and head for some time past, and certainly the insect could not have found its way there since the advent of cold weather. It had penetrated the ear far enough to be out of sight and out of reach.—*Jamestown Journal,* Jamestown, N. Y., Jan., 1908.

Mr. Philip Laurent is working as hard as usual. He always was an ardent collector. Now that he has retired from business he has more time to devote to entomology.

'**Sleeping Habit of a Bee.**—Some years ago I published a short article on the sleeping habits of some Hymenoptera, and since then have made various observations on the same and other species. A few years ago I found a little black bee sleeping on the daisies near my place; at the time I could not get it named, but recently through the kindness of Prof. Cockerell I learn that it is *Panurginus illinoiensis* Robt. Only males have been found asleep; they rest with the wings folded close to the body upon the yellow centre of the daisy. The first are found asleep about 6.30 P. M., and by 7 o'clock there are plenty of them. I notice the first specimens in the last few days of May, and they are found up to the middle of June. So soundly are they asleep, even before 7 o'clock, that one can frequently pick the flower and carry it about without disturbing the tired little slumberer.—Nathan Banks.

Announcement of the third session of the Graduate School of Agriculture, to be held July 6-31, 1908, at Cornell University, Ithaca, N. Y., and the New York Agricultural Experiment Station, Geneva, New York. Entomology will be in charge of the following gentlemen: Dr. L. O. Howard, chief, U. S. Bureau of Entomology; Professor S. A. Forbes, professor of zoology, University of Illinois; Professor M. V. Slingerland; assistant professor of economic entomology, Cornell University; P. J. Parrott, entomologist, New York Agricultural Experiment Station; Dr. James G. Needham, assistant professor of limnology, Cornell University; Dr. A. D. MacGillivray, assistant professor of entomology, Cornell University, Dr. W. A. Riley, assistant professor of entomology, Cornell University, Prof. E. Dwight Sanderson, director and entomologist, New Hampshire Agricultural Experiment Station, Dr. E. P. Felt, State entomologist of New York.

'**Samia Rubra.**—In the May number of the Ent. News for 1907, page 214, I published a query as to the probability of the food influencing the color of this species and asked for help in the investigation. I was not successful in breeding this moth during 1907 and no one else has yet sent me any data respecting it.

There is undoubtedly a local race of this species to be found in the interior of British Columbia, the general color of which is purplish brown above on all wings, whilst the underside is always grayish.

Specimens from Los Angeles show ground color of a burnt umber brown, which is reproduced in a darker shade on the underside. The markings of both forms are very variable, the only difference being in the submarginal line which, instead of being deeply dentate as in the California species, has a tendency in the Northern form to lose this dentation, the line being a series of loops bent outwardly with, in some cases, a slight dentation between the veins.

As the assembling of a large series of this genus is very cumbersome, may I ask some of our readers to send me particulars as to how far south this variety occurs? I have frequently been met with remarks from collectors to whom I have sent this form of *rubra* that it was nearer to *gloveri* than to the generally recognized form of *rubra*, but the two species are sufficiently distinct in the median lines to prevent any possibility of a mistake, but at the same time the northern form of *rubra* is so different in appearance to warrant a separation and possibly, when the investigation is carried to completion, even a new name.

Living away from all sources of information, I am not in a position to examine the types of *ceanothi*, *californica* and *euryalus*, which Dyar gives as synonymous. Possibly some of these may have had more warrant for being considered good species than is at present accorded them.—J. Wm. Cockle, Kaslo, B. C.

Notes on Erebia and Erebus.—In my list of the species of this genus, the references to the immature stages were omitted. The life-history of but two of our species have been described and one of these incompletely. In his Butt. N. Am., Vol. III, W. H. Edwards minutely described the preparatory stages of *E. epipsodea* and later H. H. Lyman (Can. Ent., Vol. XXVIII, p. 274) published the life-history of the same species, his descriptions differing somewhat from those of Edwards. The former writer has also partially described and figured the early stages of *E. magdalena*. Thus it can easily be seen how much more remains to be learned of the immature stages of *Erebia* and careful breeding, I think, will eliminate several of our forms.

The egg of *Erebia* is subconical in shape and irregularly marked with numerous raised vertical ridges. The larva, which feeds exclusively on grass, is cylindrical, tapering somewhat posteriorly, and the caudal segment, as in others of the *Satyridae*, is bifurcate.

The pupa is usually of some shade of brown or gray, with the markings darker than the ground color.

It is convex, dorsally and ventrally, and somewhat produced at the head. Pupation takes place freely about the roots of grass or on the ground.

Several of our species as they now stand in our catalogues are hardly worthy of specific rank. The number of the ocelli and the degree of mottling on the inferior surface of the secondaries I would not consider of sufficient value for distinguishing species as in both cases variation tends to be extreme.

Rossi and *fasciata* will probably prove to be varieties of the European *disa*. *Ethela* Edwards is a synonym of *sofia* Strecker and the var. *sine-ocellata* Skinner is the *brucei* of Elwes.

Vesagus which is found in some of our earlier lists as shown by Strecker is a South American species of *Lymanopoda*.

Haydenii Edw. belongs to *Coenonympha*.

Erebus odora Linn. The larva and pupa of this species have been described by Dr. Juan Gundlach in his Entomologia Cubana. In a note on *odora*, (Entom. Amer. v. 3, p. 78) H. T. Fernald gives *Ficus trigonata* as the food-plant in Jamaica and states that the larva is nocturnal in its habits, hiding in holes in the trunk during the day. Later (Ent. Am. v. 4, p. 36) he corrects this, saying that the larva in question was that of a sphinx. The egg and young larva were described in the latter article. Hy. Edwards (Bibliographical Cat. p. 98, 1888) gives *Cassia fistula*, *Pithecolobium* and *Saman* as food plants. *Odora* has been widely recorded from the U. S. and Canada. It is not rare in Jamaica, West Indies and Brazil. In Ecuador it is said to occur commonly up to an elevation of 10,000 feet.

The fact that fresh and newly-emerged specimens are taken at the extremes of its range, would indicate that it breeds, at least occasionally, in the north.

Thysania (*Erebus*) *zenobia* is another huge exotic noctuid, even larger than the preceding, which has been found in a number of localities, including Ontario, Iowa, Ohio, and Dr. P. A. Hoy (Ca Ent. v. 9, p. 210) has recorded a ♀ from near Racine, Wisconsin.—C. R. COOLIDGE.

* * *

Doings of Societies.

At the meeting of the Feldman Collecting Social, held [illegible] 15, 1908, at the residence of Mr. H. W. Wenzel, No 1523 S. 13th street, Philadelphia, the following were present: Prof. John B. Smith, Dr. D. M. Castle, Messrs. Harbeck, Kaeber, Greene, Laurent, H. W. Wenzel, H. A. Wenzel, Seiss, Sch[illegible], Viereck, Huntington and Haimbach, also Mr Flotteman visitor. Vice-President Harbeck in the chair.

Mr. C. T. Greene was elected to membership.

Letters were read from Mr. Wm. D. Kearfott of Montclair, N. J. and Dr. Walter Horn of Berlin, Germany, thanking the Social for the Souvenir pamphlets sent them.

Prof. Smith exhibited specimens and spoke about the work of *Tetramorium caespitum,* an introduced ant.

Mr. Viereck spoke about cocoons found on Ailanthus trees at Island road, in the Southern section of the City, by Mr. Flottman. These cocoons were similar in shape to the cocoons of *Bombyx mori,* and many of them were bunched together.

Mr. Greene reported the capture of one specimen of *Lebia furcata,* a Californian species, in sweeping on golden rod, at Lehigh Gap, VII, 28. Mr. Greene also told of his observation of a red scale insect, on the Palms at Horticultural Hall.

FRANK HAIMBACH, *Secretary.*

At the meeting of the Feldman Social held May 20, 1908 at the residence of Mr. H. W. Wenzel, No. 1523 So. 13th street, Philadelphia, thirteen members were present.

A letter from Prof. John B. Smith, addressed to Mr. H. A. Kaeber, was read, which referred to the cocoons spoken about in April meeting by Mr. Viereck, in which the Professor wrote that said cocoons are all *Philosamia cynthia.* It is the first time that he had seen this species make its cocoons in a bunch, and on examining the little mass, he found that most of the insects were dead and dry. In other words the caterpillars were sick when they were ready to spin up, and they formed an abnormal set of cocoons.

Mr. H. W. Wenzel reported the capture of five specimens of *Buprestis ultramarina* on April 25th, at Malaga, N. J. Mr. Wenzel also spoke about a trip with Mr. Kearfott on May 3rd to the Wachung Mountains, and on May 17th to near Malaga, N. J. The same speaker referred to records of *Buprestis decora* from North Carolina on March 1st, showing that the genus is a month or two later in appearing here than in North Carolina.

Mr. Geo. Greene exhibited specimens of the following Coleoptera: *Melasis pectinicornis* Melsh., taken at Philada., V. 17 '08; *Chromatia amoenia* Say, Philada., V, 17, '08, and *Cicindela limbalis* Lec., Howell's Pond, N. J., IV, 27, '01 and Split Rock Lake, IV, 28, '01.

Mr. Kaeber exhibited specimens of a scale insect on branches of cherry.

Prof. Calvert submitted a plan for dividing the State of New Jersey into districts, for giving localities of insects, in New Jersey list to be published. Maps were shown indicating the localities as outlined by him. The plan was considered a good one, but it was the opinion of all that rare species should be listed from the definite localities in which they have been taken.

Prof. Calvert remarked that, according to Mr. Witmer Stone, the floras of the Delaware River Valley, and of the coastal strip (excluding the beaches) are identical, but that the flora of the Pine Barrens is distinct.

Mr. Haimbach exhibited his collection of the Crambinae of North America, showing sixty-six species. Mr. Haimbach pointed out the species *Eufernaldia caderellus* Druce, which was described in Biol. Cent. Am. II, p. 290, 1896, and subsequently by Dr. Hulst in Jour. N. Y. Ent. Soc., VIII, p. 224, 1900. *Crambus bidens* and *multilineelus* were also reported having been collected in South New Jersey by Mr. E. Daecke.

Mr. Harbeck exhibited specimens of *Spilomyia fusca*, *[illegible]cornis*, *quadrifasciata* and *hamata*, species of a genus of Diptera that mimic wasps very closely.

Mr. Geo. Greene stated with reference to his communication at Feldman meeting of March 18th, that he had over-looked a record of *Platypeza ornatipes* Townsend, ([illegible] Aldrich) by Mr. Johnson, at North Mountain, Pa., thus making his record from Lehigh Gap the second instead of first record for Pennsylvania.

FRANK HAIMBACH, *Secretary*.

A meeting of the Harrisburg Natural History Association, Entomological Division, was held on Thursday evening, May 14th, in the rooms of the Division of Economic Zoology. Harris B. Schick presented a paper, entitled "The Apple and Forest Tent Caterpillars." W. R. Walton read a paper called "Notes on the Life History of *Nonagria oblonga* (Grote)." [Published in the present number of ENT. NEWS]. He exhibited specimens of the insect in its various stages, as well as some drawings of the same. Prof. G. N. C. Henschen gave an interesting talk on "The Psychic Powers of Ants," illustrating his remarks with citations from Lubbock and Forel. There was a fair attendance. Chairman A. F. Satterthwait presided.

W. R. WALTON, *Secretary.*

The Entomological Division of the Harrisburg Natural History Asso., met in the rooms of the Division of Zoology at the Capitol, on the evening of June 11, 1908, at 8 o'clock, Mr. A. F. Satterthwait presiding. Mr. H. L. Viereck gave a most interesting and instructive talk on the "The House fly and the Possibility of its Extermination." He told of its habits, its part in the spread of disease as known from experiments and from its work at the Chickamauga concentration camp where he became a victim of the fever. In view of the enormous money losses alone from the ravages of typhoid, he thinks that a crusade against the house fly would be a paying investment for the Commonwealth of Pennsylvania. The proper treating and enclosing of all manure accumulations in cities could easily be accomplished and would go a long way toward the abatement of the fly nuisance in town. Mr. W. R. Walton exhibited several specimens of the peculiar Ortalid fly *Myrmecomyia myrmecoides* (Loew). He said that in view of the fact that Aldrich gives no note of its distribution except a reference to its type locality (D. C.) and that it does not appear in Smith's list of N. J. Insects it might be well to record its capture. The specimens, five in all were taken in the immediate vicinity of Harrisburg, three of them on blackberry blossoms, one on the trunk of a locust tree and one on wild rose and all in close proximity to locust trees. Mr. P. H. Hertzog gave an account of his troubles with the wire-worms which are very troublesome about Harrisburg this year.

W. R. WALTON, *Secretary.*

The April meeting of the Heink Entomological Club of St Louis, Mo., took place at the residence of Mr. Paul Schroers on the 24th of the month, Mr. Heink in the chair.

Mr. Schroers exhibited a large number of parts of Dr. Seitz's great work "The Butterflies of the World," which were inspected with more than usual interest. This work should enjoy an ever-increasing sale among all lovers of Lepidoptera. The color plates are executed with artistic excellence and true to life, while the descriptive matter is highly entertaining and instructive. Mr. Schroers has generously decided to contribute a copy of this work to the Club's library. Mr. Poepping exhibited several well prepared life histories of *Pyrameis* and *Grapta.* Mr. Kelbly reported that he had last season found larvae of *T. Polyphemus* on a wild plum tree.

The May meeting of the Heink Entomological Club of St Louis, Mo., occurred at the residence of Mr. Geo. Graf on the 21st, Mr. Heink presiding.

Mr. Heink introduced the subject of a field day. It was decided to hold the same on May 31st, at Creve Coeur Lake, Mo., 23 miles from St. Louis. This is a resort of great natural beauty, comprising a lake, bordered on one side by very high wooded bluffs, while on the opposite shore woodland and meadow contrive to offer the naturalist a variety of opportunities.

Colleague Mr. Geo. Akerlind of Chicago described the locality at some length in the March, 1907, number of the Entomological News.

Mr. Knetzger exhibited a pair of *Pamphila delaware*, taken last July at Falling Springs, Ill., five miles east of St Louis. *P. delaware* should be added to the "List of Butterflies of St Louis and vicinity" in which it was not mentioned. A discussion followed concerning the reason why *P. delaware* found abundantly at Falling Springs, has never yet, to our knowledge, been seen on the west side of the Mississippi, notwithstanding the fact, that topography and flora here are in many places identical with those of Falling Springs, notably so at Creve Coeur Lake, Meramec Highlands and the cliffs south of the city.

Mr. Graf read a paper on his observations of metamorphoses among various orders.

According to reports from various sources neither *A. olympia* nor *A. genutia* were seen this season, altho' eagerly sought.

AUG. KNETZGER, *Secretary*.

The Brooklyn Entomological Society met April 2, 1908, at 55 Stuyvesant ave., Brooklyn with President Pearsall presiding and 18 members present.

Mr. Geo. Franck spoke on "Insects Characteristic of the Mountain Regions of New York with their relation to some low land species." His material came mainly from Sullivan County. At 800 feet altitude, *Satyrus alope* began to mingle with intermediate forms. From 1500 feet *alope* was replaced entirely by *nephele*. The two typical species never met but the intermediates bred freely with the type forms which they encountered. Mr. Dow noted that at Claremont, N. H., only *alope* occurred, the elevation being 900 to 1500 feet. Mr. Engelhardt observed that at the base of the White Mountains, probably 3000 to 3500 feet, all *Satyrus* were *nephele*.

Mr. Franck showed a long series of *Argynnis* from Sullivan County, *cybele*, grading into *aphrodite* and *aphrodite* into *alcestis*, as altitude increased. His series of *Basilarchia* showed no such gradations. Prof. J. B. Smith noted that at Delaware Water Gap *arthemis* and *astyanax* were found but *proserpina* did not occur. Mr. Pearsall noted that at Big Indian Valley, Catskills, where *proserpina* was plentiful, neither of the others occurred. He claimed positively that *proserpina* was a good species. Professor Smith admitted that at least in some localities *proserpina* met perfectly the generally accepted definition of a "species." Mr. Franck dissented and stated that at least one of his female *arthemis* from Sullivan County could not be distinguished from the type of the newly described *Basilarchia astyanax*, variety *albofasciata* Newcomb. Members of the society have an *albofasciata* ♀ from Staten Island, and a ♂ from New Brunswick, N. J., altitude in both cases being less than 150 feet. *Astyanax* is a lowland species, *arthemis* a mountain dweller.

Mr. Dow claimed that a constant difference between the two *albofasciata* seen by him and all the *arthemis* in many long series was the presence in the former of the blue or green over-sheen within the white band. The same portion of *arthemis* is invariably a duller brownish, without the iridescence common to both on the outer portion of the wings.

R. P. Dow, *Recording Secretary*

The Brooklyn Entomological Society met May 7, 1908, at 55 Stuyvesant Avenue, Brooklyn, Vice-president Graef in the chair and eleven members present.

The discussion of the previous month on *Basilarchia* was renewed. Mr. Frank Watson has a fine series from Niagara Falls including one specimen squarely between *astyanax* and *albofasciata*. Both Mr. Franck and Mr. Doll have undoubted hybrids between *astyanax* and *disippus*. From Flatbush in 1907 chrysalids from willows were generally *astyanax*. Very few *disippus* were seen in the region that year. Chrysalids from wild cherry were all *astyanax*.

Mr Schott captured at Huntington, L. I. *Anatrichus minutus* a beetle normally living in the Gulf states. He took at Jamaica L. I. *Ips confluentus*, a species not recorded in Smith's New Jersey list.

Mr. Bather reported on a trip of three months through Mexico and touching at Havana and Miami, Florida In the Mexican mountains there was an absolute dearth of insects of all orders, not even aphids on the rose tips. This was attributed to the extreme dry weather. A day's stay at Orizaba Mexico, yielded good results. An excellent box-ful containing no duplicates came from a single sequestered spot in the grounds of Morro Castle, Havana. Collecting was good in Miami in March. He had an aberrant *Eumaeus atala* from Miami in which canary yellow replaced the normally bright red abdomen and spots on the under side of the wings

R. P. Dow, *Recording Secretary*

* * *

OBITUARY.

FRIEDRICH WILHELM KONOW

Friedrich Wilhelm Konow of Teschendorf, Germany, the distinguished scholar and Hymenopterist, who worked specially in the Tenthredinoidea, died March 18th last An account of his life is published in the May number of the Deutsche Entomologische Zeitschrift.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Noctuidæ wanted in exchange. Am especially in need of a good series of *Mamestra nimbosa* at present. Have only Noctuidae to offer.—F. H. Wolley Dod, Millarville, Alta, Canada.

Will purchase or exchange *Catocala* of Missouri for a copy of Hulst's Monograph on the genus *Catocala.*—Ernst Schwarz, 6310 Newstead Ave., St. Louis, Mo.

Exchange.—Nine double boxes named Coleoptera and a number of Entomological papers; would exchange for perfect Japanese gold fish.—Aug. Schmidt. 854 E. Russell St., Phila.

Wanted.—Bibl. of Econ. Ent., parts 1, 2, 3, 6, 8; Insect Life, vol. iv, Nos. 9-12, vol. v, Nos. 6-12, vol. vi, Nos. 6-12; Lintner's 3rd and 4th Reports. I have for exchange parts of Insect Life, Expt. Sta. Record, Buls. Bur. Ent., Biol. Surv., etc.—C. O. Houghton, Newark, Del.

Wanted.—Cerambycidæ, Cicindelidæ and other Coleoptera in exchange for same from this locality. Bound vol. i, Trans. Am. Ent. Soc., 1867-8, to exchange for Horn's Monograph of the Tenebrionidæ.—C. A. Frost, 40 Grant St., South Framingham, Mass.

We offer a large number of North American butterflies in exchange. Butterflies from the United States named gratis.—Entomological Dept., Acad Nat. Sci., Logan Square, Philadelphia.

Will collect in almost any order of insects this season in exchange for Coleoptera from other localities.—R. J. Crew, 72 Sarah Street, Chester, E. Toronto, Canada.

Natural History reports issued in 1853, with the explorations and surveys for the first Pacific Railroad, will exchange for Lepidoptera.—Geo. Rossiter, 52 Tiverton Ave., Toronto, Canada.

Lucanidae and Scarabaeidæ purchased from all parts of N. America. Send price lists.—Dr. Garry de N. Hough, New Bedford, Mass.

Wanted in exchange or for cash during the coming season fertile eggs of the Apantesis group, especially such of the Southern and Western States.—M. Rothke, 807 Harrison Ave., Scranton, Pa.

Pamphila sassacus.—I am particularly anxious to get by purchase or exchange eggs of this skipper, and should like to receive with the eggs the butterfly which laid them.—J. Fletcher, Exper. Farm, Ottawa, Can.

Wanted.—Correspondence with those desiring to exchange Lepidoptera this season. Living pupae also to exchange or sell in November.—A. F. Porter, Decorah, Iowa.

Lepidoptera.—Wanted parties to exchange specimens not native to New England. Write for offers.—Will Place, Jr., 13 Parkes Ave., Providence, Rhode Island.

Will collect in all Orders, in exchange for Lepidoptera—American and exotic.—P. A. Schroers, 3807 Folsom Ave., St. Louis, Mo.

I have a great many fine exotic species of Buprestidae in duplicates which I would like to exchange for North American Coleoptera.—G. Chagnon, P. O. Box 186, Montreal, Canada.

I have or shall have for exchange eggs, larvae and pupae of *T. modesta, Sm. geminatus, Dolba hylaeus, P. ajax, P. cresphontes, Catocala vidua, illecta, cara, palaeogama, habilis.*—R. R. Rowley, Louisiana, Mo.

I want *Pachybrachys* of North America, either by purchase or exchange. Correspondence solicited.—Fred. C. Bowditch, 164 Rawson Rd., Brookline, Norfolk Co., Mass.

I want to buy eggs of *Papilio ajax*, *turnus*, *cresphontes*, *asterias* and *Telea polyphemus* and *A. luna*. Will pay 6 cts. per dozen. Write to me before sending.—Sydney L. Wright, Jr., Logan, Phila., Penna

Scarabaeidae of North America wanted for cash. Send price lists [illegible] W. C. Wood, 51 Fifth Ave., New York.

I have larvae of *Catocala illecta* feeding on honey-locust, and shall have chrysalids in a few weeks. From eggs of *C. piatrix* and *C.* [illegible] shall soon have larvae. Larvae of other later. Want *C. parta* and *C. amatrix*.—R. R. Rowley, Louisiana, Mo.

Wanted.—Parties to exchange Lepidoptera not native to New England for New England specimens. Write for offer to Will Place, Jr., [illegible] Parkes Ave., Providence, R. I.

INSECTS OF NORTH CAROLINA

I am desirous of securing accurate data concerning occurrence of all species of insects in this State. Correspondence desired with parties or institutions having North Carolina material. Willing to pay for accurately prepared [illegible] of any considerable number of species. Correspondence wanted with parties desiring material in certain groups from this State. Will gladly give suggestions to persons desiring to find suitable collecting grounds in this State [illegible] work at any season. In short, want the varied and interesting entomology of this State to be known and recognized by entomologists, and willing to [illegible] in every way to make it known and get it recorded. About 300 miles of [illegible] line and numerous mountain ranges and peaks 5000 to 6700 feet elevation [illegible] touches of subtropical and boreal faunas and all intergradations. In [illegible] mention this advertisement

FRANKLIN SHERMAN, JR., Entomologist

State Department of Agriculture, Raleigh, North Carolina

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,

6, Gunterstone Road, West Kensington, London, W

Cat. No. 17 for 1908 now ready, mailed free on demand

The only dealers' list giving authors' names throughout [illegible] mens. Equal [illegible] ex Assam, 40 different species in papers, including [illegible] *tes*, *gyas*, etc., mailed free on receipt of Post Office Order $4.00. [illegible] Catalogue, with over 300 descriptions and many interesting notes 12 [illegible]

PARCELS SENT ON APPROVAL FOR SELECTION.

FOR SALE. **COMPLETE SET OF EDWARDS' BUTTERFLIES**
Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

NATURHISTORISCHES INSTITUT "KOSMOS."

HERMAN ROLLE, BERLIN, W. 30, SPEYERER STR. 8

Offers Catalogues as follows:

Catalogue of Exotic Lepidoptera	6c	Catalogue of Exotic Coleoptera	[illegible]
Catalogue of Palaearctic Lepidoptera	12c.	Supplement to the Catalogue of Exotic Coleoptera	[illegible]

[illegible] subfamilies, localities, synonyms, etc.
Best helper for the arrangement of the collections.

The Butterflies of the West Coast

A new book. Text, descriptive and critical, of all known species, illustrated with thirty-two full page plates in best modern photographic color work, with nearly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practically out of print; is not in any dealers' stock, and only a few copies now remain in the author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAST

An abridgement of the above, consisting of the full set of plates as issued in that book, with names of all species printed on pages facing the plates, but with no descriptive text; issued as the best possible substitute for that more expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book address the author.

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

WILLIAM J. GERHARD
SCIENTIFIC BOOKS

2209 CALLOWHILL STREET
PHILADELPHIA, PA., U. S. A.

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia. 6 vols. 1861-67. Complete. Half morocco. Scarce $50.00

——Same. A copy in original parts, lacking vol. ii, No. 3 . . . . $45.00

Strecker, H. Lepidoptera Rhopaloceres and Heteroceres, etc. 15 parts and 4 supplements. 4to. 1872-1900. 15 colored plates. Scarce. . $20.00

Say. Complete writings of Thomas Say on the Entomology of North America. Edited by J. L. LeConte. 2 vols. 1859. Cloth. 54 col. pls. . $16.00

Saussure, H. de. Etudes sur la famille des Vespides. I. Guepes solitaires ou de la tribu des Eumeniens. 1852. 22 colored plates $5.00

II. Guepes sociales ou de la tribu des Vespiens. 1853. 37 col. pls. $7.50

III. Monographie des Masariens. 1856. Lacks plates. $2.50

Muller, H. Befruchtung der Blumen durch Insekten. 1873. With, Weitere Beobachtungen, 3 parts. 1879-82. . . . . $5.50

WANTED Instructor in Elementary Entomology for a Summer School for Boys. College graduate preferred.—C. A. Schenck, Pisgah Forest, N. Carolina.

FOR SALE

The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, [illegible]; *C. arizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. hornii*, .50. *Pasimachus mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. [illegible]nicus*, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Moneilema gigas*, .40; *Oncideres tessellatus*, .75; *Leptostylus yuccæ*, .50.; *Urodera crucifera*, .20; *Nodonota [illegible]*, [illegible] Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus [illegible]*, [illegible]; *Oxycnemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia [illegible]*, .40; *Spragueia plumbifimbriatus*, .25; *Hatima zethus*, .75; *Triprocris [illegible]*, .30; *[illegible] latercula*, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North American insects of all orders for sale, or exchange furnished on application

F. H. SNOW - - - LAWRENCE, KANSAS

The Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

Cocoons of HYPERCHIRIA PAMINA Neum.

and Var. AUROSEA Neum.

ARIZONA. FOOD PLANT, OAK. PRICE, $1.

Otto Buchholz, 382 Littleton Ave., Newark, N. J.

New Arrivals from Mexico, South Brazil and Java

[illegible] perfect, correctly named, specimens from Java, with bright colors [illegible] *Papilio* [illegible] etc., and [illegible] several varieties of the female [illegible] for $[illegible]

[illegible] perfect, correctly named specimens from Brazil or Mexico, [illegible] $[illegible]

[illegible] $1 [illegible] $2 [illegible] $2 [illegible] $1 [illegible] $1 [illegible] $1 [illegible] $1 [illegible] very large, [illegible] $1 [illegible]

O. FULDA, 816 BROADWAY, NEW YORK

[illegible] News to get special prices

URNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

or, E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec. Asso. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rogue, Louisiana

Advisory Board { L. O. Howard, S. A. Forbes; James Fletcher, H. A. Morgan; Herbert Osborn, H. T. Fernald

bi-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

rms of Subscription :—In the United States, Cuba and Mexico, two dollars annually in advance; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

URNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

BUTTERFLIES AND MOTHS

OR SALE, CHEAP—A collection consisting of nearly 3000 named cimens representing an excellent lot of interesting exotics, as well as a good es of North American species, both diurnals and nocturnals.

ed. M. Mueller, 167 Evanston Ave., Chicago, Ill.

---

000 PIN-LABELS, TWENTY CENTS!

d from the smallest type made. About 30 on a strip. No trimming—One cut makes a label. Send Money Orders s must be in multiples of 500, and no order will be filled for less than 500 each of 2 labels or 1,000 of one

Y. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

M LOOKING for collectors who deal with insects, pupae, butterflies and larvae from Mexico, Texas, Arizona and California paying cash. Reding further information, communicate with JOSEPH VER, 335 East 49th Street, New York.

NOVA SCOTIAN INSECTS

IDOPTERA—in papers—pinned—full data given—named—in finest condition—many rare kinds

specimens of 70 species, $6,00 **200 specimens of 140 species, $11.00**

Prices include cost of transportation
Lepidoptera, Diptera, Coleoptera and other insects of other Orders at very low rates

HN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YOR

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.

K.-S. Section Cabinets.

Schmitt Insect Boxes.

K.-S. Lepidoptera Boxes, Cde

and Duplicate Boxes.

K.-S. Screw Handle and Aa

Nets.

The Asta Insect Pins:

White, 60c. per 100

Black, 70c. per 100

Catalogue II. Entomological Supp

Apparatus.

THE KNY-SCHEERER C

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPO
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMEN

North American and exotic insects of all orders in perfect
Single specimens and collections illustrating mimicry, protective
dimorphism, collections of representatives of the different orders of
Series of specimens illustrating insect life, color variation, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect
Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

[illegible] Printer, [illegible] N. 7th Street, Philadelphia.

Stanford University Library
OCT 8 1908

OCTOBER, 1908.

ENTOMOLOGICAL NEWS

Vol. XIX. No. 8.

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON.
PHILIP LAURENT.
HENRY L. VIERECK.
WILLIAM J. FOX.
J. A. G. REHN.
H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter

THE KNY-SCHEERER C

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YOR

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.
K.-S. Section Cabinets.
Schmitt Insect Boxes.
K.-S. Lepidoptera Boxes,
and Duplicate Boxes.
K.-S. Screw Handle and
Nets.
The Asta Insect Pins:
White, 60c. per 1000.
Black, 70c. per 1000.

Catalogue 11, Entomological [illegible]
[illegible]

THE KNY-SCHEERER C

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York, N.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXP
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect condition.
Single specimens and collections illustrating mimicry, protective
dimorphism, collections of representatives of the different orders of insects.
Series of specimens illustrating insect life, color variation, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect
Lepidoptera boxes, etc.), cabinets, nets, insect pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

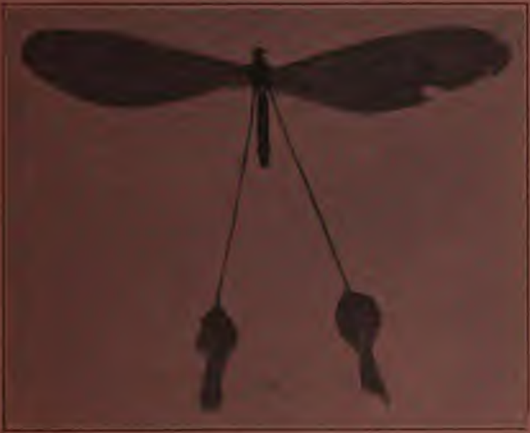
[illegible], Printer, [illegible] N. 7th Street, Philadelphia.

Stanford University
OCT
8
1908

OCTOBER, 1908.

ENTOMOLOGICAL NEWS

Vol. XIX. No. 8.



Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
EZRA T. CRESSON.
PHILIP LAURENT.
HENRY L. VIERECK.
WILLIAM J. FOX.
J. A. G. REHN.
H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September**, in charge of the Ento
logical Section of the Academy of Natural Sciences, Philadelphia,
and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE

Outside of the United States and Canada, $1.20

SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal disco
on longer insertions. No advertisement taken for less than
60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NEW
Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

CHOICE PAPILIOS

Papilio androcles	2.00	*Papilio helenus*	
" *blumei*	1.50	" *philoxenus*	
" *buddha*	.50	" *mayo*	
" *gigon*	.45	" *rhodifer*	
" *ascalaphus*	.50	" *memnon*, female, male	
" *sataspes*	.35	*Ornithoptera pompeus*	
" *milon*	.45	" *brookeana*	
" *paris*	.50	" *hel[illegible]*, male	
" *[illegible]*	.50	" " female	

Automerus pamina
male and female, per pair 7.00

Crinodes biedermani
male and female, per pair 3.5

One pair of each in perfect condition.

Extra fine specimens of *Phyllium siccifolium* (leaf insects) from [illegible], $[illegible]

The above listed specimens are in papers, in perfect condition.
Send 12 cents additional with each order to cover the postage.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, P

**I'll be happy in Corrrsponding and Exchanging Papers a
Material of Study with Economic Entomologists, a
especially with Miriopologists and Acarologists.—Pr
Carlos E. Porter, Casilla 2352, Santiago, Chile**

CATALOGUE OF THE

NEUROPTEROID INSECT

(EXCEPT ODONATA)

OF THE UNITED STATES

BY NATHAN BANKS

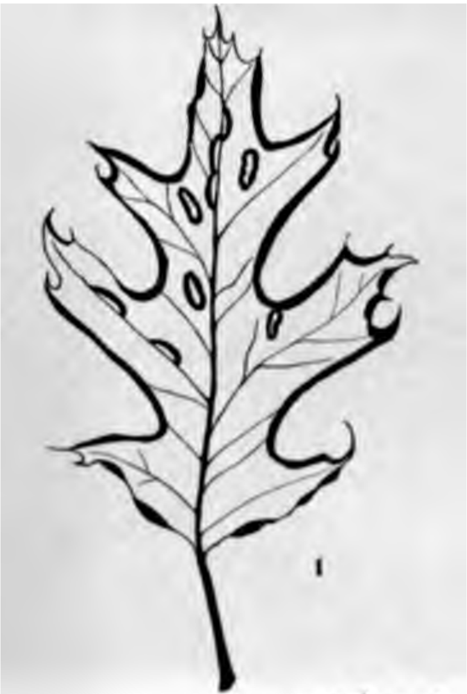
Complete to Summer of 1907   Price 50 cts. (net) per copy   Mailed on receipt of pr

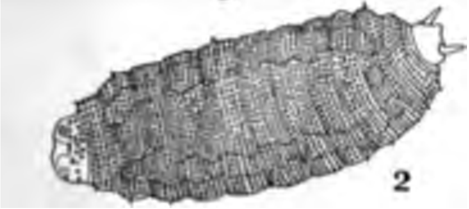
☞ Send for copy of New Additions to ☜
Price List; just issued.

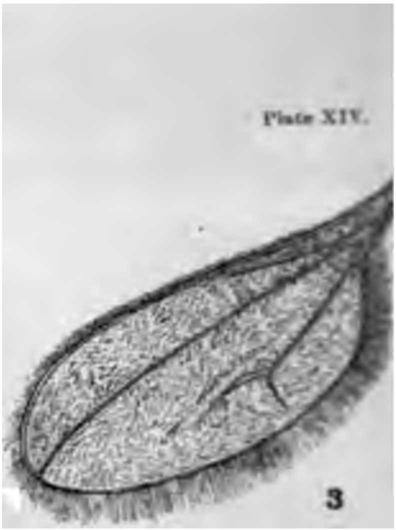
E. T. CRESSON, Treas., P. O. Box 248, Philadelphia, P

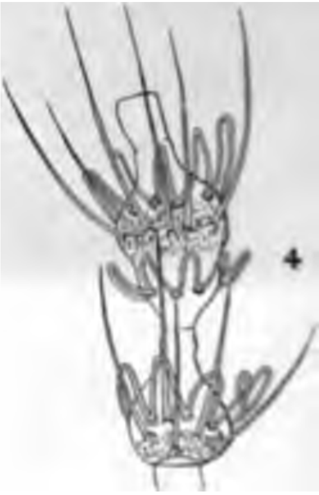
When Writing Please Mention "Entomological News."

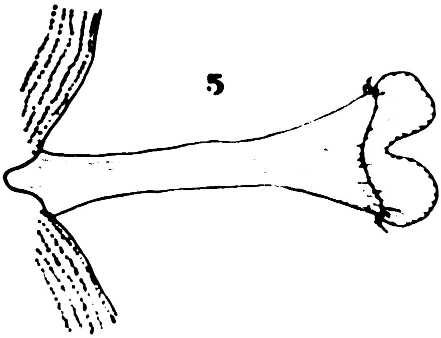
Plate XIV.

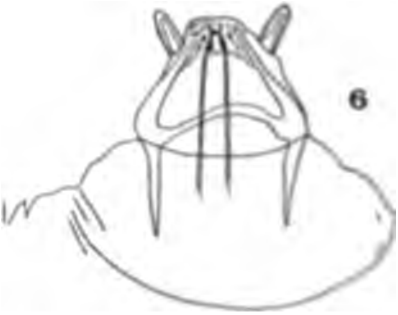

1


2


3


4


5


6

A NEW CECIDOMYIID ON OAK—RUSSELL AND HOOKER.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. OCTOBER, 1908. No. 8.

CONTENTS:

Russell and Hooker—A new Cecidomyiid on Oak 349
Mitzmain—Insect Transmission of Bubonic Plague: a study of the San Francisco Epidemic 353
Sherman—Notes on Tiger Beetles and Elevations 360
Brues—The occurrence of the Remarkable Braconid genus Helorimorpha in America 363
Howard—Upon the Aphis-feeding species of Aphelinus 365
Dury—An interesting new Agrilus from Cincinnati, Ohio 368
Porter—A List of Local Lepidoptera found at Decorah, Iowa 369
Johnson and Rohwer—Colorado Bembicidae 373
Mitzmain—Synopsis and Bibliography of California Siphonaptera 380
Davis—Standards of the number of eggs laid by Insects—VII 383
Editorial 384
Entomological Literature 385
Notes and News 386
Doings of Societies 389
Obituary—Prof. Paul Biolley 394
Simon H. M. Seib 396
Monsieur P. A. P. Finot 396
Prof. Gustav Mayr 396

A New Cecidomyiid on Oak.

By H. M. Russell and C. W. Hooker,

Massachusetts Agricultural College, Amherst, Mass.

(Plate XIV)

This insect was discovered by Mr. W. V. Tower, in July, 1905, working on the leaves of a black oak. He began observation on its life history but was called away and the work was taken up by Mr. H. M. Russell. Mr. Russell had practically finished, except for describing the adult, when he left to take a position with the U. S. Department of Agriculture and the subject was placed in my hands to complete. In addition to verifying Mr. Russell's observations, I have described the adult, which Mr. E. P. Felt kindly determined as a new species. The gall which it forms has been described by Osten Sacken as *C. erubescens.**

This species of gallfly is very abundant on a black oak (*Quercus coccinae* var. *tinctoria* group) growing near the President's house on the college grounds. This oak is in a small clump of red oaks, none of which have become infested; this seems to indicate that this Cecidomyia will feed only on black oak, as the infested tree harbors many thousands of the larvae and under its branches, the adults are found in swarms. Every leaf is infested, by from one to over one hundred, as high up as one can climb, certainly within ten feet of the top; but the infestation at the highest point is not as extensive as that of the lower limbs.

---

*Mon. N. A. Dipt. I, p. 200, n. 20, 1862, "Folded margin of an oak leaf, tinged with red. This deformation seems to resemble that of C. quercus Lw. on the European oaks. Occurs in the spring."

Cecidomyia (?) **foliora** n. sp.*

Female.—Length, 1.95 to 2.55 mm. Antennae of 14 segments, length .95 to .99 mm.; the two basal segments light yellow, the others brown, thickly clothed with coarse brown hairs. Face bright orange red, back of head with a fringe of dark brown setae. Mesonotum Van Dyke brown, with pale submedian lines, sparsely covered with fine setae Sternum, pro and metapleura light brown, mesopleura dark brown Abdomen with the five basal segments bright orange-red, thence gradually fading to a light yellow at the apex and lemon yellow on the protrusible ovipositor;—within a few days the color of the ovipositor often darkens to an orange-red. Surface sparsely clothed with yellow setae. Legs light yellow, thickly covered with dark brown pubescence.

Male.—Length, 1.20 to 1.65 mm. Antennae 1.50 to 1.65 mm. Scutellum orange-red; pleura pale brownish yellow, mesopleura marked with black. Abdomen orange-brown.

The large bright orange-red abdomen and larger size of the females, make them quite conspicuous among the smaller males with their dull-colored abdomens. The color darkens within a few days after collecting, so that fresh material is necessary for identification; the gall, however, is quite characteristic and cannot be mistaken.

Described from nineteen specimens on eight pins, and from sixteen specimens mounted on six microscopic slides—eighteen male and seventeen female cotypes. These have been deposited as follows: Two females and one male (one slide), and two females and three males (two pins) in the collection of the United States National Museum at Washington, D. C., two females and one male (one slide), and two females and three males (two pins) in the collection of the New York State Entomologist, Albany, N. Y.; the remainder- five females and five males (four slides), and four females and five males (four pins) in the collection of the Massachusetts Agricultural College.

---

* Foliora from *folium*, leaf and *ora*, edge.

Six females and seventeen males (six slides) and five females and six males (six pins) from the same series have been marked Paratypes and are in the collection of the Massachusetts Agricultural College, as are also slides of the early stages.

This insect may ultimately prove to belong to another genus, but I follow Dr. Felt (in litt.) in referring it tentatively to Cecidomyia.

LIFE HISTORY.

Adult.—The adult insect emerges from the ground from May 1 to 20, and all have disappeared by June 1. In the spring of 1908, the author caught five adults May 4, and by May 11 the insects were found under the tree in thousands, being so numerous that it was only necessary to sweep an open cyanide jar over the top of and through the grass to obtain all the specimens desired. The adults appear just as the leaves begin to unfold. For a time, after emerging, large numbers will be found in the early morning and on wet days especially, under the tree, but as it gets warmer and the dew dries off, they rise among the branches. They have a feeble flight, however, and do not fly out beyond the borders of the tree. When the leaves are one to two inches long, the females fly to the leaves and begin to lay their eggs, for the most part on the under side.

Eggs.—The eggs are laid without any regular order, attached to the leaf by the posterior pole and placed diagonally to the plane of the leaf surface. The egg is minute, appearing to the eye like a reddish protuberance. Under the microscope it is seen to be almost perfectly oval, .27 mm. long and .09 mm. wide. The surface is smooth and the egg shell transparent, the reddish color more intense at one end, being due to the larva inside. Most of the eggs are scattered irregularly between the veins on the lower surface, but a few are generally laid, apparently by chance, on the upper side. From fifty leaves, an average of seventy eggs was obtained for each, with not over six on the upper side, but the total number varied from forty to one hundred and twenty. On one leaf, an inch and three-quarters of an inch wide, there were two hundred and eighty-one eggs on the lower surface and one hundred and seventy-five on the upper. This, however, is an exceptional case.

Larva.—The larva hatches in from four to six days, the time varying with the weather. The body is pale orange, the head a shade darker. Length .27 mm.; width .10 mm. They go at once to the edge of the leaf, or to any hole in it, and begin to feed on the upper surface. After about four days of this feeding, the edge beings to curl over on to the upper surface, forming a roll, the upper side of which becomes more or less reddish. Within this roll, the larva continues to feed, extending the roll as it grows. Occasionally, a young larva feeds for a time in a circle on the exposed surface of the leaf, causing it to become reddish and wrinkled. By May 22, nearly all the leaves near the ground show the rolls, which in some cases, nearly encircle the leaf, while in others, they may be about one-quarter of an inch long. In [illegible] an inch long, twenty-five larvae were found; while in others, only a few were present. As a rule, the longer the roll, the fewer insects they contain relatively. The insects remain in the larval stage through the summer, becoming full grown by the last of September or first of October, when all but those parasitized descend into the ground and pupate to pass the winter. In exceptional cases, perfect larvae are not able to escape from the roll in the fall, and so pass the winter in the gall, emerging at the usual time in the spring through cracks or punctures in the drier rolls.

Parasites.—This gallfly is attacked by a chalcid egg parasite which appears at the same time in swarms almost as large as those of the host. The female chalcid walks around among the Cecidomyia eggs touching them rapidly with her antennae and stopping every now and then to insert her ovipositor and lay an egg in one of the host eggs, but neglects those surrounding it.

A species of mite was also found to be very abundant under and on the tree, and though it was not seen attacking eggs or larva, conditions were such that it may be considered as possibly a parasite.

EXPLANATION OF PLATE XIV

1 Lower side of leaf showing galls, half natural size.

2 First stage of larva, not over six days old, just beginning to form galls on oak leaves. X 100.

3. Wing of *C. foliora*. X 25.

4 Segment of antenna of male; greatly enlarged.

5. "Wishbone" of full grown larva, greatly enlarged.

6 Dorsal view of head of full grown larva, greatly enlarged.

* * *

Mosquitoes Invade City. Swarm Comes to Town and Plays Havoc Before Storm. Just before the heavy storm last night a large swarm of mosquitoes flew into the city and caused a great deal of annoyance and plenty of work for physicians in the hospitals of the northeast section. In about fifteen minutes after the swarm struck the city the hospitals began to receive patients with their faces and hands so badly swollen that it was necessary in some cases to lance them to draw out the sting of the bite. On Girard Avenue, east of Belgrade Street, the pests stripped all the trees of their leaves. After they had passed the trees looked as though autumn had come.—*Philadelphia Press*, July 24, 1908. [!!!]

Insect Transmission of Bubonic Plague: a Study of the San Francisco Epidemic.

By M. B. Mitzmain, B.S.

The role of the flea in the transmission of bubonic plague lends particular interest to observations on the species of fleas infesting rats in the San Francisco epidemic.

In the present campaign of rodent extermination eighteen hundred rats have been examined by the writer. From the latter part of August to December 1st he spent much of his time in the plague-infected districts of San Francisco and other towns where the existence of the plague was suspected. In this connection an effort was made to locate the source of the rat and flea introduction into the infected regions.

SOURCE AND DISTRIBUTION OF SPECIES OF FLEAS.

From coasting ships and river steamers the common flea obtained was of the species *Ceratophyllus fasciatus* Bosc, and those collected from ships from oriental ports were of the species *Ctenopsylla musculi* Duges and *Pulex cheopis* Roth. There appeared to be a definite invasion of the introduced species. Along the water front and east to the Latin quarter in San Francisco there came to my obseravtion certain evidence of flea introduction. As far as could be determined the oriental rat flea seemed to disappear east of this line within ten city blocks, and only the common rat flea, *Ceratophyllus fasciatus*, made its appearance. In outlying districts I have not succeeded in collecting ship rat fleas. I have secured negative evidence to determine that the foreign fleas are alone responsible for plague transmission. On twenty plague rats not one of the alien species was obtained. The flea in evidence was that common to the Pacific coast, *Ceratophyllus fasciatus*. This species is the predominant rat flea in the counties bordering the bay. It was collected in San Francisco, Oakland, Point Richmond, and in districts where plague had been reported by the local health boards. At Point Richmond nineteen rat fleas were collected in a warehouse which was a probable source of human plague, and all proved to be the common species. From one infected rat (*Mus decumanus*) taken from old Chinatown, ninety fleas were obtained, eighty-five per cent. of which were *C. fasciatus*. In Oakland, Alameda and Berkeley the rat flea *C. fasciatus* predominates to a marked degree. Ninety-five per cent. are the common species, the remainder being for the greater part *Ctenocephalus canis*, the cat and dog flea.

Ctenopsylla musculi Duges is suspected of being a recent immigrant. This species was first collected in North America by Dr. Duges from a seaport town in Mexico. It was originally described as a new species with the name *Ctenopsylla mexicana*. It is, however, synonymous with *Ctenopsylla musculi*. This species was found principally on ships from the orient and on one ship which came from Mexican ports *Ctenopsylla musculi* was found. It is found along the harbor front and one-half mile inland. Rats from the orient are no doubt responsible for its introduction into San Francisco.

Pulex cheopis Roth. originally was collected by Rothschild in Egypt, but is universal in its distribution. It has been recorded from southern Europe, Asia, Africa and Australia, but never from North America. This is the flea which is charged with eighty to ninety per cent. of insect transmission of plague in India. It was collected from ships in the harbor which had visited ports in the Philippines, Japan and Hawaii. It was collected in San Francisco two blocks from the water front on *Mus decumanus*, the brown rat. On shipboard its host was found to be the black rat, *Mus rattus*. On land it was found in company with *Ctenopsyllus musculi* on rats' from a water front grain warehouse. Nine species of this flea, *Pulex cheopis*, were received from Assistant Surgeon Ebert, who removed them from his person. Dr. Ebert is an officer in the United States Public Health and Marine Hospital Service and employed in plague quarantine on ships from the orient and South America. It was while on duty sulfuring the holds of the S. S. "Mongolia" that he first became aware of the attacks of the parasites. Fortunately for the victim, the "Mongolia" enjoyed a clean bill of health. The significance of the oriental flea introduction may be appreciated by the fact that eight or ten cases of the plague have been removed from shipboard since the present San Francisco epidemic.

Ctenocephalus canis Curtis on rats appears to be more numerous in the metropolis than on rats collected in the trans bay region. This species was perhaps contributed to the rat by its feline and canine hunters. This accounts probably for the greater number of *Ctenocephalus canis* found on rats in the more densely populated quarters. On shipboard *Ctenocephalus canis* was never collected from rodent hosts. The ship cat is not reputed to be a rat hunter. The constant petting and feeding by the sailors does not stimulate hunting natural prey and the inaccessibility of holds of vessels is a substantial check to rat catching. Thus an interchange of parasites between the two animals was not to be expected nor in any instance has it been known to occur. Numerous ship pets inadvertently left in the cabins during fumigation proved victims to the sulfur fumes. One species of flea only, the cat flea, was found on these.

Relatively few fleas of the human species *Pulex irritans* Linn. were obtained from live or dead rats. It was the least numerous of all the fleas found on animal hosts. Those collected were harbored by brown rats in a grain warehouse and stable in San Francisco.

In the study of ship rat fleas twenty-five vessels were inspected and methods of rat extermination investigated. The vessels in every instance were thoroughly sealed and fumigated with three per cent. SO_2 gas obtained from burning crude sulfur. The rats when exposed to five hours of sulfuring are blinded after the third hour, when they scamper about to escape the deadly fumes before they succumb. Invariably the dead rats are found with opaque lenses,—an evidence of blindness before death. Formerly three hours was the length of exposure to sulfur fumigation. The rats were rarely killed, but merely rendered stupid by the fumes and men with clubs killed them. Upon collecting these rats I found that the fleas soon revived and gave evidence of their activity when the containers were opened. It was concluded that three hours' exposure was not sufficint to kill the parasites in this peculiar environment. It appeared that a blanket of pure air enveloped the rodent's body which the gas would not penetrate in the three hours of sulfuring. After these facts were established an exposure to five hours was the minimum time set. In an exposure to five hours this hypothetical layer of air surrounding the animal's body was presumably destroyed and the fleas exposed directly to the sulfur fumes. Endeavoring to escape, the fleas would jump about when the rats became blind and succumbed to the slowly penetrating sulfur fumes. Some were found on the floors of the holds and the comparatively few fleas found on the rat were asphyxiated in attempting to extricate themselves or jumped on the rat from the floor when the deadly fumes were becoming effective. Evidence of this was obtained in the fact that all the specimens collected from the rats were found clinging to the ends of the hairs.

When a vessel had received its fourth or fifth fumigation, providing the captain had observed the legal precautions (keeping the vessel fended off six feet and wearing rat guards on all her lines when alongside the docks) the rats aboard proved to be a negligible quantity. Efforts were taken under these circumstances to collect the fleas directly from the holds by means of fly paper wound about the shoe tops of a person as [illegible] walked through holds and between decks. This method proved ineffectual for trapping purposes, though it is followed with success when fleas are plentiful. The claim made [illegible] on unsubstantiated evidence that live fleas invariably leave the dead body of a rat is considered untenable. I have found fifteen live fleas on the carcasses of forty black and brown rats. These had been cold for thirty six hours, showing signs of decomposition. Dr. Hobdy, Chief Quarantine Officer of the United States Public Health and Marine Hospital Service, located a number of dead rats in a stable near the harbor. [illegible] of these were examined by him and showed about [illegible] fleas in the cervical region of each. These rats had been dead for at last forty eight hours, infested as they were with half grown larvae of blow flies. At the City Board of Health hea quarters and the district plague sub-stations live fleas have been taken from numerous rats (as many as ninety-seven from a single rat) which had been dead from periods ranging from eighteen to sixty hours.

The British Indian Plague Commission has demonstrated beyond a doubt the method of rat flea plague transmission. Hundreds of plague rat fleas have been carefully dissected and their internal organs minutely inspected for any evidence of plague bacilli. The salivary glands, the theoretical centre of infection, were, after many painstaking attempts, successfully isolated from the body cavity. These were examined and a plague like organism was found within the secretory ducts. In addition, many fleas were crushed and inoculated into healthy animals. These latter, in every instance where the fleas had been removed from plague rats, succumbed to typical plague lesions. It was taken for granted upon experimental evidence that the transmission was due directly to the co-operation of the salivary glands in the action of the blood-sucking mandibles and epipharynx.

In a second series of experiments the commission attempted to test further the validity of this theory. Live fleas were removed from septicemic Plague Rats and placed in small vials covered with flea net gauze. A flea-clean healthy animal was selected and from a small area on the back the hair was shaved. The mouth of the vial was then placed against the smooth skin and the flea permitted to bite through the gauze, After biting, the insect was immediately withdrawn and the animal placed in a flea-proof cage and observed. A similar animal was taken and treated in an identical manner, but immediately on withdrawing the flea, after it had bitten, a platinum needle loopful of a plague flea's intestinal evacuation was rubbed into the bite. These experiments were duplicated and the results showed a marked uniformity. In no instance did the flea bite alone prove fatal, but in a large percentage the bites which were accompanied by the inoculation of the intestinal discharges caused a rapid death with post mortem plague positive verifications. It appears, then, that the disease transmission from rat to man is due essentially to the introduction of the intestinal evacuations into the bite of the flea. It is the "rubbing it in" which is significant.

In the first experiments performed by the British Indian Plague Commission a technical oversight was suffered in their premature conclusions concerning the infectivity of the salivary glands. In this instance the investigators neglected to provide control measures. A bacteriological determination of the natural flora of the healthy flea's salivary glands should have been first obtained. I have isolated from the body cavity of this insect in the normal state numerous bipolar rod organisms resembling the plague bacilli.

Experimentally an insect like the *Stomoxys*, the stable fly, affords a good medium for transmission of *Bacillus pestis*. In the laboratory one can inoculate the stable fly by feeding plague cadaver. In this respect the flea is not a good subject, as it seems to prefer starvation to feeding on cadaverous tissue. By keeping the plague meat moist with sterile broth the fly is able to subsist for six to ten days. An examination of the proboscis and intestinal tracts of a fly thus nourished reveals innumerable plague-like organisms, proving also culturally positive. The *Stomoxys* which commonly bites man could transmit *Bacillus pestis* directly through the proboscis from the salivary glands. The intestinal discharges would be vastly greater in volume of bacterial content than even those of the flea, which is reputed to evacuate ten to one hundred thousand bacilli per cc. Consequently, the rubbing process in the case of the fly would have to be reckoned with. The question arises in what environment, in nature, would the flies be exposed to contamination by plague. We know that rats devour each other; that the weak and sick are at all times exposed to the attacks of the stronger. Thompson, Journal of Hygiene (1906, Vol. vi, 550) makes the statement that in Bombay at the Plague Laboratory more than eight per cent. of the rat carcases brought in had been devoured by their fellows, and sometimes so completely that nothing but head, paws, tail and skin remained. The cadavers of plague rats, as we have seen in San Francisco, are soon torn open, and the viscera exposed. Many of these have been found in harbor front stables covered with flies. The stable fly will feed on the plague tissue that presented when live tissue is not directly available. A bite from the fly after such infection would indeed prove disastrous.

Careful observers have noted in the history of an outbreak in its incipiency that it becomes effective in this wise: First, it is observed that an unusually large number of rats in a certain locality come out into the open and, acting queerly, unconscious of the presence of enemies, die in a short time. Then ensues a lull of several days, followed by the illness of the first human victims. It is during this lull in the history of a plague epidemic that there appears to exist an abnormal supply of rat fleas. This latter fact is amply illustrated from incidents in the San Francisco epidemic. In the early part of the campaign Dr. William Wherry, Bacteriologist of the San Francisco Health Department, collected one hundred and eighty fleas from two rats sent in from the Latin Quarter, a pest-ridden district. On four rats taken from Meigg's wharf in San Francisco there were counted approximately two hundred and forty fleas. Three of these rats were autopsied and one was found to have a pronounced case of plague, verified by Dr. Hobdy, U. S. A., clinically and bacteriologically. Under normal conditions and in districts removed from plague, the rats harbor an average of three or four fleas.

Observations were taken to determine whether rat fleas will bite the human. Baker states (Proc. U. S. Nat. Mus. '05) that rat fleas in America were never known to bite man. Since we know definitely how the plague is transmitted from rat to man it must be taken for granted at the outset that man has been rat flea bitten in many instances, as the San Francisco official plague records will show. Specific instances can be cited. In the improvised bacteriological laboratory of the San Francisco Health Department hundreds of dead and live rodents were brought daily. Fleas from these rats hopped freely about the floors and work tables, making things irritable for attendants and health officers. On shipboard nine specimens of rat fleas were collected preying on one of the surgeons in the United States Public Health Marine Hospital Service. My personal experiences contribute the fact that rat fleas taken directly from live rats or even rats which have been dead for several hours, will not bite the human until they have been permitted to starve in a test tube for two days or longer.

Notes on Tiger-Beetles and Elevations.

FRANKLIN SHERMAN, JR., Dept. Agric., Raleigh, N. C.

In company with Mr. C. S. Brimley, I spent the first two weeks of May this year (1908), in the southern part of the mountainous region of western North Carolina, for purposes of zoological exploration. This region contains some of the highest peaks and ranges of the entire Appalachian mountain system, and as it is near the southern terminus of the system, it furnishes an excellent field for observations on the effect of elevation upon distribution. During the trip the counties of Transylvania, Jackson, Macon and Cherokee were collected in to greater or lesser extent, the localities ranging from 2,000 to 4,300 feet elevation.

The season was undoubtedly too early for the best observations on some species of Tiger-beetles, but certain ones which were observed, especially *C. purpurea*, seemed to show such definite limits of distribution, that it seems worth while to place these observations on record.

Cicindela repanda.

Already recorded throughout all the western two-thirds of the state, and at various elevations, but is generally restricted to lighter-colored soils, gravels, sands, etc., in vicinity of streams. One specimen was taken along roadside on mountain at Andrews at about 2,500 feet elevation. The only water near was small rills, hardly large and deep enough for me to find opportunity to drink. At Lake Toxaway, 3,000 feet elevation, several specimens were taken along shores of lake

Cicindela sexguttata.

The specimens collected on the trip may belong to the variety *harrisi*. The species was frequently taken, and still more frequently seen, at various elevations from 2,000 to 3,500 feet. At Andrews in Cherokee County it was a common species on the lower parts of a mountain road, being mingled at the higher elevations with *splendida* and *purpurea*. It was also common at an elevation of 2,500 to 3,000 feet along road from Highlands to Franklin, in Macon County, and was also taken at Blantyre, Transylvania County, and at Aquone, Macon County

Cicindela vulgaris.

This species which is found throughout at least the greater part of the state occurs principally in early spring and in fall. Only one specimen was taken,—at Andrews, Cherokee County along a mountain road at about 2,500 feet elevation. This species is on record from so many parts of the state that it was not specially sought for or noticed on this trip. It was probably present at other places.

Cicindela unipunctata.

This species has been recorded from our N. C. mountains before, but this was the first time I had ever taken it. Four specimens were taken at Andrews, at elevations ranging from 2,000 to 2,500 feet. In accordance with the observations of others we did not find it in hot, open, sunny places, but in shady corners, or where shade was close at hand. Possibly it does not usually become active until dusk.

Cicindela patruela.

Henshaw's check-list gives this as a variety of 6-*guttata,* but Leng, in his Revision, regards it as distinct. It averages larger than 6-*guttata,* has the middle band complete, and in this state is known only from the mountain region while 6-*guttata* has been taken in all sections. One specimen of *patruela* was taken at Blantyre, Transylvania County, at the very top of a mountain at about 3,000 feet elevation. I do not recall ever having taken this species at less than 2,000 or 2,500 feet, and I have come to consider it as a strictly mountain species in this state.

Cicindela splendida.

Henshaw lists this as one of the many varieties of *purpurea,* but Leng recognizes it as a distinct species, with which my observations agree, though the two may be connected by intermediate forms in other sections. *Splendida* averages smaller, is quite local in its distribution, is decidedly different in color, (the dorsum of prothorax being bright green, and not cupreous as in *purpurea*) is found (in this State) at lower elevations, and is in my experience a quicker, more wary species and harder to capture. Several were observed along the road from Highlands to Franklin in Macon County. But it was on a road going up a mountain at Andrews that we found it most common. Here it was abundant between elevations of about 2,500 to 3,500 feet. At the lower part of this range it was mingled with about equal numbers of *sexguttata*, and at the higher elevations a few *purpurea* were found with it. My first specimens were taken in this same part of the State several years ago and I have come to regard it as mainly a mountain species, though I have taken it at two localities fully a hundred miles east of the mountains.

Cicindela purpurea.

Even before this trip, I had come to regard *purpurea* as one of the typically northern insects which ranges in our state only along the higher ridges. I first took it here (six years ago) at an elevation of about 4,000 feet, and it reminded me forcibly of western New York State where I first knew it. I have on other occasions taken it at other places in North Carolina but only at high, cool elevations. On this trip I took special note of its occurrence. It was taken at five different localities but in every case at elevations of not less (as best I could determine) than 3,000 feet. At Sapphire, (Jackson County) where the whole county is a plateau of about 3,000 feet elevation, it was found at ordinary levels. At Aquone, which is a much broken section it was found on ridges above the valleys at about 3,000 feet and upwards. At Blantyre, our only specimen was taken at about 3,000 feet on the top of the same mountain with our one specimen of *patruela*. In driving from Highlands to Franklin (Macon County) we traversed country ranging from 2,200 to 4,000 feet. *Purpurea* was encountered several times at the higher elevations but not seen at all at the lower levels. At Andrews in ascending a mountain road we found our first specimens at about 3,000 feet and it was found from there to the top at about 4,000 feet.

It is of course unsafe to draw sweeping conclusions from the casual observations of a few weeks, but my experience on this trip, as well as others before, leads me to believe that in our mountain section many interesting facts can be worked out in regard to the distribution of insects (of all kinds) at varying elevations.

The Occurrence of the Remarkable Braconid Genus Helorimorpha in America.

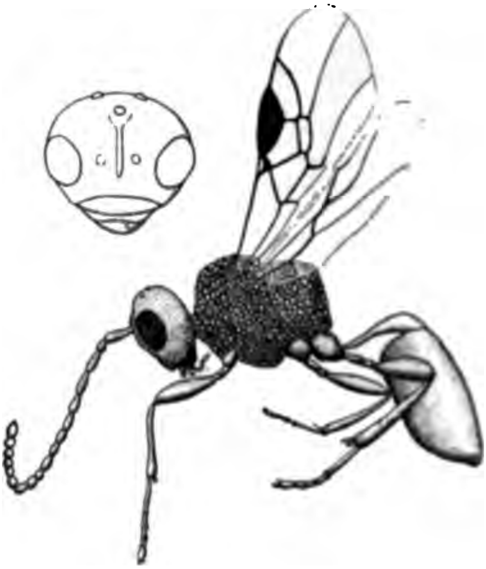
By Charles T. Brues, Public Museum, Milwaukee.

In 1907, Professor Otto Schmiedeknecht described a very peculiar little species of Braconidæ to which he gave the name *Helorimorpha egregia* (Hym. Mitteleuropas, Jena, 1907, p. 523). The genus was new to science and for its reception, its author established the subfamily Helorimorphinæ, which he placed between the Meteorinæ and Leiphroninæ in the scheme of classification adopted in that work. The single specimen upon which Prof. Schmiedeknecht based his description seems to have been the only one so far recorded, and I was therefore very much surprised recently to receive from my friend Professor A. L. Melander, a second specimen which represents a very distinct but closely allied species collected by him some years ago at Woods Hole, Massachusetts. Like its European congener, the American species is probably very rare, as the present specimen is the only one taken during several summers of active collecting in the vicinity, by both Professor Melander and myself.

It gives me great pleasure to dedicate the species to its discoverer, in remembrance of the many entomological excursions which we have taken together into the interesting territory surrounding Woods Hole.

Helorimorpha melanderi sp. nov.

Female.—Length 4 mm. Honey-yellow; the head, except mouthparts, and the antennal flagellum black. Head seen from above, transverse, two and one-half times as wide as thick, and full behind the eyes. Eyes small, nearly circular, no longer than the large, broad cheeks. Front strongly excavated on each side above the insertion of the antennæ, the depressions separated by a strong median carina which extends from below the base of the antennæ nearly to the median ocellus. Ocelli small, placed in a small equilateral triangle which is distinctly raised and bordered by a raised line. Head margined behind on the occiput, temples and cheeks. Clypeus transverse, elliptic, very broadly and slightly emarginate anteriorly; mandibles long, acute, apparently with a broad tooth some distance before the tip. Surface of head faintly punctulate above, very closely so below, clypeus sparsely punctate, cheeks, temples and occiput smooth and polished. Antennæ 18-jointed; scape as long as the first flagellar joint, pedicel small, subglobose; flagellar joints gradually shortening to the ninth which is ovoid, following moniliform. Maxillary palpi 4-jointed. Entire thorax, including pleura, reticulated or coarsely pitted with large, almost confluent thimble-shaped punctures. Metathorax short, abruptly declivous behind; longitudinally concave on the posterior slope. Abdomen smooth and highly polished, inserted very low down between the hind coxæ, its petiole long and slender, curved and dilated at the tip as in some males of the Cryptinæ, with a few delicate striæ at the base. Remainder of abdomen narrowly ovate, second segment concealing all the others, the ovipositor barely projecting beyond its tip. Legs rather stout, all the femora and the posterior tibiæ clavate, tips of posterior tibiæ and their tarsi black; posterior tibiæ with two short, subequal spurs. Wings hyaline, with dark stigma and pale venation. Stigma large and broadly ovate, as long as the marginal cell. Radial vein bent at a right angle, its second section regularly arcuate. First transverse-cubitus as long as the first section of the cubitus, second very short, almost interstitial with the first section of the radius; submedian cell a little longer than the median, second cubital cell two and one-half times as long as wide.



Helorimorpha melanderi sp. nov.

Described from one female, Woods Hole, Mass. (A. L. Melander) July 21, 1902.

The present species differs from *H. egregia* Schmiedeknecht by its honey yellow thorax and abdomen, and more strongly clavate abdominal petiole. The abdomen is also less distinctly [illegible] and the wing venation slightly different.

The genus *Helorimorpha* is the representative of a very remarkable group and reminds one strongly of certain Euphorinae, except for the well developed wing venation, longer second abdominal segment, and more distinctly moniliform antennæ. I cannot but think that it must be an archaic form related to the stock from which the modern Euphorinæ have developed. In fact, I have a typical member of the Euphorinæ probably representing an undescribed genus with an abdomen almost exactly like that of *Helorimorpha*.

Upon the Aphis-Feeding Species of Aphelinus.

By L. O. Howard.

Down to a comparatively recent date, the only Chalcidoid of the subfamily Aphelininae known to parasitize Aphididae was *Aphelinus mali* Hald., described by Haldeman in the Proceedings of the Boston Society of Natural History, Volume VI, 1860, pages 402-403, under the name of *Eriophilus mali.* It was reared by Haldeman from *Schizoneura* (*Eriosoma*) *lanigera,* and is referred to under this name by Comstock in his Report as Entomologist for the United States Department of Agriculture for 1879, and is figured at Plate VI, figure 6, from specimens reared by the writer from *Schizoneura lanigera* occurring upon apple upon the grounds of the Department of Agriculture at Washington. The species had apparently also been reared from the same host by Walsh in Illinois and by Riley in Missouri. Since then it has been found to be a rather general parasite of Aphididae, and the following records occur in the writer's Revision of the Aphelininae of North America (Technical Series No. 1, Division of Entomology, U. S. Department of Agriculture, 1895) where it was placed in its proper genus, *Aphelinus;* by F. M. Webster from *Glyphina eragrostidis* at Lafayette, Indiana, September 6 to 10, 1885; by the same observer from *Aphis brassicae* on turnip; by T. A. Williams, at Lincoln, Nebr., from *Pemphigus fraxinifolii,* June 10, 1890; by the same observer from *Aphis monardae* at Ashland, Nebraska, May 24th, 1890, and by W. H. Ashmead from *Siphonophora rosae* at Jacksonville, Fla., in April, 1881 (described by Doctor Ashmead as *Blastothrix rosae,* unfortunately placing it in the wrong family). Still later and as yet unrecorded rearings of this interesting species have been made by Zehntner from *Aphis sacchari* at Pasoroean, Java, and in the insectary at Washington by Pergande from *Tetraneura colophoidea,* November 7, 1897, from Cabin Johns Bridge, Maryland. The species seems, therefore, to be not only a very general parasite of Aphididae, but also seems to be of wide distribution.

Aphelinus mali was at once set off from the other species of *Aphelinus*, with one exception, by the possession of hairy eyes, and this character, taken in connection with its different host relation, has suggested the advisability of erecting a new genus to contain it and the allied forms that have since been discovered. It also differs in its black color from the Coccid-inhabiting species. A single individual of an *Aphelinus* having hairy eyes and being black except for the head and extremities of the abdomen was collected by Koebele in the Santa Cruz Mountains, California, and has been described by the author (Technical Series No. 1) as *A. flaviceps*, the statement being made at the same time that the species would probably ultimately be found to be parasitic upon some Aphidid, this conclusion being reached from the prevalence of the dark color and from the possession of hairy eyes. *A. flaviceps*, however, has never since been reared, and the accuracy of this theoretical suggestion has not been proved or disproved. Comparatively recently however two additional species have been reared from Aphididae, which are also characterized by the possession of a preponderance of black in the coloration and by eyes that are hairy. These species, *A. semiflavus* n. sp. and *A. nigritus* n. sp. are described below.

TABLE SEPARATING THE APHELINUS PARASITES OF APHIDIDAE.

FEMALES.

- Eyes obviously hairy.
  - Head black, base of abdomen yellow, hind femora pallid . . . ***mali*** Hald.
  - Head yellow, abdomen yellow at base and tip, all legs orange-yellow . . . . ***flaviceps*** How.
  - Head and abdomen entirely black . . . ***nigritus*** n. sp.
- Eyes obscurely hairy.
  - Abdomen light yellowish, darker at margins, all legs yellowish or slightly dusky . . ***semiflavus*** n. sp.

MALES.

- Third funicle joint twice as long as pedicel and six times as long as broad; club one-fourth longer than third funicle joint ***semiflavus*** n. sp.
- Third funicle joint very slightly longer than pedicel, and slightly more than three times as long as broad; club rather more than twice as long as third funicle joint . . . . . ***mali*** Hald.

Aphelinus semiflavus n. sp.

Female.—Length 1.08 mm.; expanse 1.87 mm.; greatest width of fore wing 0.3 mm. Antennæ short, excluding scape about the length of face; pedicel long, more than three times as long as wide; funicle joints 1 and 2 subequal in length and width and each slightly less than one-third length of pedicel; joint 3 two-thirds length of pedicel and about as wide as its tip; club slightly swollen, ellipsoidal, and about twice the length of pedicel. Eyes faintly hairy. General color black; thorax smooth, shining, scape and pedicel dusky, flagellum pallid, club becoming somewhat dusky at tip; front and middle femora and all tibiæ somewhat dusky; hind femora straw yellow. Abdomen light yellow shaded around margin with brownish. Wings rather short, otherwise normal.

Male.—Length 0.85 mm.; expanse 1.58 mm.; greatest width of fore wing 0.204 mm. Differs from female in having antennæ nearly uniform brown, scape slightly darker, and in the proportions of third funicle joint and club. Third joint cylindrical, twice as long as pedicel and six times as long as broad; club one-quarter longer than third funicle joint, elongate ovate in shape.

Described from 14 ♂ ♀ specimens reared by C. P. Gillette, Fort Collins, Colo., July 15, 19, 1908, from *Myzus persicae,* and reared at Washington from the same host sent in by Professor Gillette. The parasitized host turns black.

U. S. N. M. type No. 12031.

Aphelinus nigritus n. sp.

Female.—Lenth, 0.68 mm.; expanse, 1.7 mm.; greatest width of fore wing, 0.26 mm. Flagellum of antennæ short, not as long as face; pedicel obconical, about twice as long as wide; first and second funicle joints very short, together less than half as long as pedicel; third funicle joint about as long as thick, and about as long as, or slightly shorter than pedicel; club about three times as long as third funicle joint, about twice as long as broad, obliquely truncate at tip. Body uniformly black, shining. Mesoscutum, including parapsides, with faint, sparse, small, irregular punctures. All legs and antennæ pale yellow except for a duskiness of the hind tibiæ and the tip of the antennal club.

Male.—Unknown.

Described from six ♀ specimens reared by G. G. Ainslie, Bureau of Entomology, Spartanburg, S. C., from *Toxoptera graminum.*

U. S. N. M. type No. 12032.

An Interesting new Agrilus from Cincinnati, Ohio.

By Charles Dury.

Agrilus ferrisi n. sp.

Color, shining cupreous. Head coarsely, strigosely punctured. Antennae serrate from the fourth joint. Front densely pubescent with white hairs, and with a deep median groove. Prothorax slightly broader than long. Sides almost parallel, rounded at front angles and sinuate in front of obtuse hind angles, which are carinate in both sexes. Disk coarsely punctured and strigose, with a dense patch of white pubescence each side, extending from base to apex. Scutellum transversely carinate. Elytra costate from humeri nearly to tip. Sides slightly sinuate behind the humeri and dilated behind the middle, thence tapering to tip, which is serrulate and prolonged into an acute spine. The surface of elytra is muricately punctured and transversely wrinkled. The elytra project beyond the tip of last abdominal segment in both sexes. The pygidium is not carinate. Beneath, the entire thorax, sides of meso- and metasterna, and a large patch on the sides of each ventral segment, densely white pubescent. Claws bifid. The sexual organs are very peculiar. The male organ is composed of three pieces, the middle one being longest and bluntly pointed at tip. The shorter side pieces are acute at tip, and with a fringe of long hairs each side. There is a channel down the centre of the tip of the middle piece. The tip of last ventral segment is bluntly rounded and has a deep groove running around it near the edge. In the female the last segment is squarely truncate, and the projecting ovipositor is tapering and emarginate each side, and squarely truncate at tip. The segment has a feeble longitudinal carina at middle and a curved groove each side. Length, 10-11 mm.

Fifteen specimens. Beaten only from Hackberry *Celtis occidentalis*. Cincinnati, Ohio, June 7 to July 2. This species leads to a large group of forms found in Mexico and Central America, in which the elytral apices are prolonged and otherwise curiously modified in various ways. I am unable to find anything like it described in the Biologia, or Dr. Horn's paper Trans. Amer. Ent. Soc., xviii, p. 277.

Named in honor of Miss Phebe Ferris, in whose woods I found all of the specimens. During her lifetime she was a devoted lover of our virgin forests, and realized the importance of their preservation. A specimen deposited in U. S. Nat. Museum.

A list of Local Lepidoptera found at Decorah, Iowa.

By A. F. Porter.

RHOPALOCERA.

14 *Papilio thoas.*
11 " *turnus.*
22 " *polyxenes.*
37 *Pontia protodice.*
36 " *occidentalis.*
40 " *rapae.*
60 *Zerene eurydice.*
61 " *caesonia.*
61 " *rosa.*
65 *Eurymus eurytheme.*
65 " *ariadne.*
65 " *eriphyle.*
66 " *philodice.*
" *albino.*
83 *Eurema nicippe.*
85 " *euterpe.*
85 " *alba.*
92 *Euptoieta claudia.*
95 *Speyeria idalia.*
99 *Argynnis cybele.*
100 " *aphrodite.*
100 " *alcestis.*
102 " *atlantis.*
131 *Brenthis myrina.*
141 " *bellona.*
185 *Charidryas nycteis.*
186 " *ismeria.*
189 *Phyciodes tharos.*
205 *Polygonia interrogationis.*
205 " *umbrosa.*
206 " *comma.*
206 " *dryas.*
209 " *faunus.*
214 " *progne.*
215 *Eugonia j-album.*
217 *Euvanessa antiopa.*
219 *Vanessa atalanta.*
220 " *huntera.*
221 " *cardui.*
223 *Junonia coenia.*
236 *Basilarchia astyanax.*
237 " *arthemis.*
239 " *archippus.*
244 *Chlorippe celtis.*
248 " *clyton.*
258 *Cercyonis alope.*
258 " *nephele.*
286 *Enodia portlandia.*
299 *Cissia eurytus.*
308 *Anosia plexippus.*
311 *Hypatus bachmani.*
347 *Thecla calanus.*
384 *Strymon titus.*
Feniseca tarquinius.
390 *Gaeides dione.*
393 *Chrysophanus thoe.*
399 *Heodes hypophleas.*
440 *Cyaniris ladon.*
440 " *marginata.*
442 *Everes comyntas.*
484 *Atrytone hobomok.*
512 *Hylephila campestris.*
516 *Thymelicus brettus.*
523 " *cernes.*
526 *Polites peckius.*
528 *Euphyes verna.*
584 *Epargyreus tityrus.*
601 *Thorybes pylades.*
605 *Pholisora catullus.*
625 *Thanaos juvenalis.*
617 " *brizo.*
642 *Hesperia tessellata.*
643 " *montivagus.*

HETEROCERA.

653 *Hemaris diffinis.*
656 " *thysbe.*
667 *Amphion nessus.*
670 *Deilephila gallii.*
671 " *lineata.*

672 *Theretra tersa.*
678 *Pholus pandorus.*
679 " *achemon.*
681 *Ampelophaga choerilus.*
682 " *myron.*
686 *Dilophonta ello.*
696 *Phlegethontius quinquemaculata.*
697 " *sexta.*
700 *Sphinx kalmiae.*
701 " *drupiferarum.*
706 " *chersis.*
713 " *canadensis.*
716 " *eremitus.*
720 *Chlaenogramma jasminearum.*
721 *Ceratomia amyntor.*
722 " *undulosa.*
728 *Marumba modesta.*
729 *Smerinthus jamaicensis.*
731 *Paonias excaecatus.*
732 " *myops.*
734 *Cressonia juglandis.*
739 *Samia cecropia.*
747 *Tropaea luna.*
748 *Telea polyphemus.*
753 *Automeris io.*
2800 *Catocala epione.*
2805 " *ilia.*
2820 " *relicta.*
2827 " *cara.*
2828 " *nurus.*
2831 " *californica.*
2840 " *whitneyi.*
2804 " *celia.*
2907 " *lineella.*
2877 " *desdemona.*
2892 " *crataegi.*
2851 " *mariana.*
2854 " *briseis.*
2857 " *parta.*
2830 " *concumbens.*
2848 " *unijuga.*
2912 " *grynea.*
2872 " *cerogama.*
2868 " *piatrix*
2900 " *praeclara*

2907 *Catocala nerissa.*
2911 *Euparthenos nubilis.*
874 *Apantesis virgo.*
892 " *figurata*
882 " *arge.*
879 " *rectilinea*
875 " *virguncula.*
895 " *vittata.*
878 " *parthenice.*
895 " *phalerata*
3226 *Oreta rosea.*
3123 *Nadata gibbosa*
3124 *Nerice bidentata*
771 *Anisota rubicunda*
767 " *stigma*
770 " *virginiensis*
4008 *Caberodes majoraria*
3214 *Malacosoma americana*
3090 *Apatelodes torrefacta*
2448 *Stiria rugifrons*
1053 *Harrisimemna trisignata*
2980 *Homoptera lunata.*
2986 " *edusa*
851 *Estigmene acraea*
840 *Haploa lecontei*
840 " *militaris*
842 " *contigua*
3180 *Euthyatira pudens*
3022 *Ennomos subsignarius*
3023 " *magnarius*
3220 *Drepana genicula*
972 *Apatela americana*
984 " *lepusculina*
1031 " *impressa*
1041 " *oblinita*
1037 " *xylinifomis*
991 " *interrupta*
1002 " *clarescens*
993 " *lobeliae*
850 *Isia isabella*
2487 *Autographa* [illegible]
2519 " *simplex*
2207 *Scoliopteryx libatrix*
1774 *Mamestra imbrifera*
1800 " *grandis*
1807 " *picta*
1822 " *legitima*

Mamestra laudabilis.
" *lorea.*
" *anguina.*
" *adjuncta.*
Paragrotis furtivus.
" *redimicula.*
Porosagrotis retusta.
Melalopha albosigma.
Evergestis straminalis.
Pantographa limata.
Eudule mendica.
Heterophleps triguttaria.
Hadena arctica.
" *lignicolor.*
" *devastatrix.*
" *bridghami.*
" *mactata.*
" *dubitans.*
" *verbascoides.*
Halisidota tessellaris.
" *maculata.*
Ctenucha virginica.
Euchaetias antica.
" *oregonensis.*
" *pudens.*
Hypoprepia fucosa.
Xanthotype crocataria.
Euthisanotia unio.
Chamyris cerintha.
Hypsopygia costalis.
Euchoeca albovittata.
Drasteria crassiuscula.
Lycia cognataria.
Cicinnus melsheimeri.
Pyrausta pertextalis.
Eustroma atrocoloratum.
" *prunata.*
" *testata.*
Dyspteris arbortivaria.
Epicnaptera americana.
Hydriomena autumnalis.
Desmia funeralis.
Phragmatobia fuliginosa.
Eubaphe brevicornis.
" *opella.*
Hypena humuli.
Rhodosea julia.

2921	*Parallelia bistriaris.*
1540	*Feltia herilis.*
1538	" *subgothica.*
1544	" *gladiaria.*
1549	" *volubilis.*
3294	*Tephroclystis absinthiata.*
2613	*Eustrotia carneola.*
1963	*Heliophila albilinea.*
1979	" *commoides.*
1954	" *pseudargyria.*
1953	" *unipuncta.*
3120	*Lophodonta ferruginea.*
3121	" *angulosa.*
1295	*Pyrophila pyramidoides.*
3327	*Eucymatoge intestinata.*
3173	*Habrosyne scripta.*
3971	*Euchlaena kentaria.*
4516	*Pyralis farinalis.*
3208	*Tolype velleda.*
2469	*Panchrysia purpurigera.*
3934	*Hyperitis nepiasaria.*
3468	*Haematopsis grataria.*
2078	*Xylina disposita.*
2095	" *innominata.*
3664	*Sciagraphia mellistrigata.*
3931	*Plagodis phlogosaria.*
3929	" *fervidaria.*
787	*Scepsis fulvicollis.*
2300	*Heliothis armiger.*
1370	*Adita chionanthi.*
2206	*Eucirroedia pampina.*
862	*Diacrisia virginica.*
1464	*Peridroma astricta.*
3117	*Notodonta simplaria.*
2945	*Phurys perspicua.*
1454	*Agrotis ypsilon.*
1455	" *geniculata.*
2179	*Papaipema nitela.*
2183	" *cerussata.*
2187	" *cataphracta.*
2190	" *rutila.*
2230	*Orthosia helva.*
2222	" *bicolorago.*
2536	*Abrostola urentis.*
3916	*Eugonobapta nivosaria.*
3850	*Cleora pampinaria.*
1267	*Polia diversilineata.*

3487 *Synelys ennucleata.*
3881 *Phigalia titea.*
3245 *Paleacrita vernata.*
4016 *Sabulodes lorata.*
4011 *Tetracis crocallata.*
3986 *Metanema quercivoraria.*
3913 *Metrocampa praegrandaria.*
4007 *Caberodes confusaria.*
3956 *Euchlaena obtusaria.*
3957 " *effectaria.*
3964 " *marginata.*
3960 " *johnsonaria.*
3886 *Cingilia catenaria.*
792 *Lycomorpha pholus.*
2149 *Sphida obliqua.*
2204 *Trigonophora periculosa.*
1054 *Microcoelia dipteroides.*
2197 *Pyrrhia umbra.*
2920 *Panapoda rufimargo.*
2979 *Pheocyma lunifera.*
2915 *Phoberia atomaris.*
2760 *Euclidia cuspidea.*
836 *Utetheisa bella.*
2131 *Cucullia speyeri.*
957 *Panthea furcilla.*
1422 *Eueretagrotis sigmoides.*
2165 *Gortyna immanis.*
2161 " *velata.*
2162 " *nictitans.*
2060 *Tricholita signata.*
1297 *Heliotropha atra.*
2456 *Plagiomimicus pityochromus.*
908 *Raphia frater.*
2328 *Schinia cumatilis.*
1300 *Prodenia ornithogalli.*
2551 *Marasmalus inficita.*
4208 *Sesia tipuliformis.*
2380 *Dasyspondaea lucens.*
1280 *Trachea delicata.*
3177 *Pseudothyatira expultrix*

1087 *Crambodes talidiformis.*
2618 *Galgula partita.*
2044 *Graphiphora garmani.*
2015 " *oviducta.*
3065 *Bomolocha baltimoralis*
2556 *Anomis erosa.*
1921 *Ulolonche modesta.*
1481 *Noctua c-nigrum.*
1496 " *clandestina.*
1491 " *collaris.*
3100 *Datana angusii.*
3098 " *ministra.*
3106 " *perspicua.*
3108 " *integerrima.*
3118 *Pheosia dimidiata.*
3092 *Melalopha apicalis.*
3096 " *albosigma.*
3095 " *strigosa.*
3111 *Hyperaeschra stragula*
3148 *Schizura ipomoeae.*
3151 " *unicornis*
3150 " *semirufescens*
3153 " *badia.*
3149 " *concinna.*
3133 *Heterocampa obliqua.*
3136 " *umbrata*
3137 " *manteo*
3138 " *subrotata*
1200 *Dipterygia scabriuscula*
1375 *Eutolype rolandi*
1885 *Morrisonia sectilis*
1885 " *vomerina*
2361 *Ipimorpha pleonectusa*
3145 *Ianassa lignicolor*
3164 *Harpyia scolopendrina*
3162 " *cinerea*
3160 *Cerura occidentalis*
4142 *Cossus centerensis*
3438 *Gypsochroa designata*
1049 *Arsilonche albovenosa*

NOTE. Names are taken from H. G. Dyar's "List of N American Lepidoptera," and the numbers preceding spec names correspond to those in the above mentioned work should be pleased to receive exchange lists from all parties d siring any of the species on this list.

Colorado Bembicidae.

BY S. A. JOHNSON AND S. A. ROHWER.

The main object of this paper is to give the distribution, within the State, of the species which are known to occur here, and to add a few species which have hitherto not been reported. The notes are based principally on the collection of the Colorado Agricultural College, but a few species have been taken by the junior author.

To make the paper more complete, tables to separate the genera and species are offered.

The family may be separated into two distinct subfamilies as follows:

Middle tibiæ with two spurs at apex; ocelli normal, round. . . STIZINÆ.
Middle tibiæ with one spur at apex; ocelli more or less abnormal, especially the anterior one . . . . BEMBECINÆ.

STIZINÆ.

Marginal cell much longer than the first cubital; species large. **Sphecius** Dahlb.
Marginal cell much shorter than the first cubital; both large and small species . . . . **Stizus** Latr.

SPHECIUS Dahlb.

This is a small genus, containing but four species in the United States. These are all southern forms. There is but one species known from Colorado, *S. speciosus* Drury. We have two females and a male from Las Animas, Col., August 17, 1901. The thorax is rufous.

STIZUS Latr.

Species large; metathorax not emarginate posteriorly (*Megastizus*). . 1.
Species smaller, about 10 mm.; metathorax emarginate posteriorly (*Stizus*) . . . . 2.
1. Wings mostly blue-black; first and second transverse cubiti meeting, or nearly so, on the radial; second dorsal abdominal segment with a rufous band, other segments black. . . **unicinctus** Say.
   Wings hyaline; first and second transverse cubiti distinctly separated on radial; abdomen with many pale spots or bands. **brevipennis** Walsh.
2. Black, with pale markings . . . . **godmani** Cam.
   Yellow, with a few black markings . . . . **subalpinus** Ckll.

Stizus (*Megastizus*) **unicinctus** Say.

We have not seen this species. It is recorded from Colorado by Cresson (cat.), and Ashmead (Colo. list).

Stizus (*Megastizus*) **brevipennis** Walsh.

We have a male of this species from Ft. Lupton, Colorado. July 22, 1900.

Stizus (*Stizus*) **subalpinus** Ckll.

This was described as a variety of *flavus* Cam., but inasmuch as all the northern ones are as pale as *subalpinus*, it may be called a species, Two males, Ft. Collins, Col,, Aug. 7, 1904.

Stizus (*Stizus*) **godmani** Cam.

Two males, Boulder, Col. Aug. 30, 1907, fls. of *Helianthus pumilis* (Roh.). This species is common at Las Cruces, New Mexico. We have seen many specimens collected by C. H. T. Townsend from flowers of *Solidago canadensis*.

BEMBICINÆ.

Mandibles simple; maxillary palpi 3-jointed, labial palpi 1-jointed; species about 10 mm. long . . . . **Microbembex** Patt.
Mandibles armed with a tooth; species longer than 10 mm. . 1
1. Metathorax emarginate posteriorly . . **Bembidula** Burm.
Metathorax not emarginate posteriorly, flat or convex 2
2. Anterior ocellus linear; maxillary palpi 4-jointed, labial palpi 2-jointed **Bembex** Fabr.
Anterior ocellus round or elliptic; palpi otherwise 3
3. Maxilla long, reaching hind coxæ; maxillary palpi 3-jointed, labial palpi 1-jointed; anterior ocellus elliptic . **Steniolia** Say
Maxilla short; maxillary palpi 6-jointed, labial palpi 4-jointed anterior ocellus round or reniform . **Stictia** Illiger

MICROBEMBEX Patt.

This genus is quite distinct. There is apparently but one species known, but it has at least five distinct forms, some of which may at a later time be raised to specific value. They may be separated as follows:

Clypeus and labrum mostly black . . 1
Clypeus and labrum entirely yellow . . 2
1. Posterior face of metathorax with a large pale spot on each side, a large pale spot on pleura; two pale parallel lines on middle of mesonotum . . . . **monodonta occidentalis**

Posterior face of metathorax without a pale spot on each side, or with a very small one; spot on pleura small or wanting; no lines on the mesonotum . . . . **monodonta.**

2. Venter black, except a small spot on each side of second and third segments; band on first abdominal segment dentate in middle; markings greenish or pale yellowish. **monodonta neomexicana.**

Venter with much more yellow . . . . 3.

3. Mandibles black; scape entirely black; pectus not margined with yellow . . . . **monodonta deltaensis.**

Mandibles yellow; scape in front yellow; pectus margined with yellow . . . . **monodonta argentifrons.**

Microbembex monodonta monodonta Say.

This subspecies seems to be eastern. The female described by Patton (p. 362, v, Bull. U. S. Geol. Survey) was from Connecticut. We have a male and female from New Jersey. The mark on the pleura is wanting in both of these. Patton (loc. cit., p. 363) describes the specimens from Kansas as differing from the eastern ones in much the same way as *occidentalis* differs from *monodonta.*

Microbembex monodonta occidentalis subsp. n.

The characters in the above table will separate this subspecies from *monodonta monodonta* its nearest ally. The markings in all the specimens before us are greenish. The silvery pile is usually quite dense. We have specimens from Paris, Tex. (C. R. Jones), and Colo.

Microbembex monodonta neomexicana subsp. n.

This subspecies seems quite distinct. The dentation of the first abdominal band, the mostly black venter, the yellow clypeus and labrum make it easily recognized. The markings vary from greenish-white to pale yellow. On the average it is smaller than the two preceding subspecies. Many specimens from Las Cruces New Mexico, August 30th, at flowers of *Solidago canadensis* (C. H. T. Townsend).

Microbembex monodonta deltaensis subsp. n.

The table will separate this from the other subspecies. The markings are lemon-yellow. The sides of the venter beyond the second segment, and the second ventral segment except the spine are yellow. The abdomen above is mostly yellow. The pale markings on the head and thorax are large. Length 10 mm. Many male specimens from Delta, Colo., July [illegible] 1898.

Microbembex monodonta argentifrons Cress.

This subspecies was described as a distinct species from Cuba by Mr. Cresson.

BEMBIDULA Burm.

This genus is not well represented in Colorado, there being but two species, but an apparently new one is added here. It is from New Mexico. The table is based on the males.

Larger (about 18 mm.); postscutellum black; spots on the abdominal segments much wider at the sides, spots eight in number growing smaller towards apex . . . . . . **quadrifasciata** Say

Smaller (about 14 mm.); postscutellum marked with yellow; spots of abdomen not or but little wider at the sides, spot on all the segments narrowly separated in the middle . . 1

1. Clypeus black; punctures of dorsulum close; tibiae with a black stripe; bands on abdomen rather narrow . . **ventralis** Say

Clypeus with a large pale spot; punctures of dorsulum larger and more separated; tibiae entirely pale; bands on the abdomen broader . . . . . . **meliloti** Koh. [illegible]

Bembidula ventralis Say.

Female, Cope, Colo., Aug. 19, 1905 (S. A. Johnson

Bembidula quadrifasciata Say.

Female without a label, but probably from Ft Collins Colo., having been picked up by a student.

Bembidula meliloti Koh., n. sp.—♂. Length about 14 mm.; [illegible] finely closely punctured, along the anterior margin are a few larger punctures, mandibles with two rather small teeth within, front [illegible] similar to clypeus, first joint of the flagellum a little longer than [illegible] apical joints slightly produced beneath, apical joint obliquely [illegible] dorsulum punctured with rather large punctures, which are separated (not widely so, however) on the posterior part, the anterior part and near tegulae they are closer, scutellum punctured like posterior part of dorsulum, if anything, more sparsely so, mesopleura with large separate punctures, metathorax sculptured like scutellum, or perhaps the punctures are a little closer; angles broadly, obtusely rounded, [illegible] of anterior tarsi emarginate at base beneath, middle femora with a strong, stout spine at base beneath, abdomen distinctly reticulate [illegible] segment with large, strong punctures; spines long, obtusely pointed, lateral ones curved; stipes of the genitalia broad, somewhat the shape of a knife-blade, but not very sharply pointed; at apex and sides with a strong fringe of hairs; ventral segments beyond first with some large punctures among the close fine ones. Black; spot on base of mandibles, large transverse, irregular spots on clypeus, inner orbits for two-thirds of the way above clypeus, narrow line on lower two third of posterior orbits, palpi, line on pronotum, tubercles, tegulae, a line above, spot on each side of scutellum, line on postscutellum, angles of metathorax, legs below about the middle of femora, broad bands on dorsal abdominal segments 1–6, usually narrowly interrupted in middle, small spot on each side of seventh dorsal segment, spots on sides of ventral segments 2–5, *yellow* or *greenish-white:* the color of the legs is bright yellow, the other markings are more or less greenish; stripes of genitalia reddish-yellow; wings yellowish hyaline, nervures brown; head and thorax with white pubescence, that on the head the longest; in one wing the second tr. cu. is wanting.

Hab.—Pecos, New Mexico, Sept. 2nd, at fls. of *Melilotus alba* (Ckll.).

This species is close to *B. ventralis* Say, but may be known from it by the characters given in the above table, and in having the first joint of anterior tarsi emarginate at base beneath.

BEMBEX Fabr.

Males.

Prominence of sixth ventral segment bifid at apex . . . . . **amoena** Hdl.
Prominence of sixth ventral segment simple at apex . . . . 1.
1. Dorsulum spotted . . . . **sayi** Cress.
Dorsulum not spotted, or at least not notably so . . . . 2.
2. Markings of abdomen bright yellow; femora yellow, except base sometimes; larger (20 mm.) . . . . **nubilipennis** Cress.
Markings of abdomen greenish-white; femora largely black; smaller. **spinolae** St. Farg.

Females.

Metathorax with a good deal of yellow; larger . . . . 1.
Metathorax black, or with a little yellow; smaller . . . . 2.
1. Wings at base clouded . . . . **nubilipennis** Cress.
Wings hyaline . . . . **sayi** Cress.
2. Pleura black, without spots; bands of abdomen continuous. **spinolae** St. Farg.
Pleura spotted . . . . 3.
3. Bands of abdomen separated; mesopleura with two spots. **amoena** Hdl.
Bands of abdomen continuous; mesopleura with one large spot . . 4.

4. Length 20 mm.; abdomen hardly pubescent (Utah) . . **[illegible]** Fox
Length 14 mm.; abdomen distinctly pubescent . . **primaaestate** n. sp.

Bembex nubilipennis Cress.

Male, Rocky Ford, Colo., July 4, 1904; female, labeled "F. F. C."

Bembex sayi Cress.

Female, Salida, Colo., Oct. 3, 1898; 2 females, Cope, Colo. Aug. 9, 1905 (S. A. Johnson).

Bembex amoena Hdl.

Male, Alamosa, Colo., Aug. 6, 1903; male, Rocky Ford, Colo., July 4, 1904.

Bembex spinolae St. Farg.

Two females, Pueblo, Colo., Aug. 10, 1907 (Hite); female, Sept. 12, 1907, fls. *Chrysothamnus graveolens*, also Oct., 6, 1907, Boulder, Colo. (Roh.). The Boulder ones have a very small spot below tegulae.

Bembex primaaestate John. and Roh., n. sp.—♀. Length 14 mm.; clypeus rather irregularly punctured with shallow punctures; mandibles with a small tooth, about one-fourth from apex; front impunctate, or [illegible] punctured, very finely so; ocellar region with some distinct punctures; vertex and occiput straight; scape and first flagellar joint of about equal length, first joint of flagellum fully as long as 2 + 3; dorsulum with rather indistinct, close punctures, sparse on posterior part, scutellum with punctures more distinct and separated; mesopleura finely punctured; metathorax punctured as scutellum; anterior tarsi strongly flattened, base of first joint emarginate beneath; pulvilli large and somewhat bent toward apex; abdomen above rather strongly reticulate, apical segments punctured; ventral segments finely reticulate, with some large punctures. Black; clypeus, labrum, mandibles, except apex, which is piceous, scape and flagellum beneath, inner orbits to ocelli, interocellar spot, spot between antennae, a large spot on each side of first abdominal segment above, segments 2-5 with broad bands, which are dentate at the sides (second and third more strongly so), and spot on ventral segments 2, 3, 4, *greenish-white*; posterior orbits, prothorax except a spot in the middle, tegulae, spot above, a spot on each side of scutellum, line on postscutellum, large spot on mesopleura, spot above middle coxae, a large and small spot on metapleura, spot on trochanters, most of femora (more deeply so at sides), tibiae except a small spot beneath at apex, and tarsi, *bright yellow*. wings clear hyaline iridescent, head, thorax and abdomen with long white pile.

Hab.—Denver, Colo., 1889 (S. A. Johnson).

This species runs in Fox's table (Proc. Acad. Nat. Sci. Phil., 1895, p. 354) to *B. connexus* Fox, but it is not that species. It probably is more closely related to *B. spinolae* or *B. amoena*, but may be separated from these species by the foregoing table.

STENIOLIA Say.

Middle tibiae and tarsi simple ; markings bright yellowish.
duplicata Prov.
Middle tibiae and tarsi dilated ; markings greenish-white . **obliqua** Cress.

Steniolia duplicata Prov.

Two females, Cortez, Col., Aug. 10, 1903 ; female, Boulder, Col., Sept. 7, 1907 (Roh.). We have also seen this species from Las Cruces, New Mexico, Aug. 30th, at fls. of *Solidago canadensis* (Townsend). This species has so far only been found on the plains. It is probably a southern form, finding its northern limit in Colorado.

Steniolia obliqua Cress.

Male and female at Florissant, Col., June and July, some at fls. of *Edwinia americana* (Roh.) ; Ward, Col., July, 1905, at fls. of *Gilia* (Ckll.) ; Wet Mountain Valley, Custer Co., Col. (Ckll.). This is the most common Bembicid in the mountains. So far it is not been reported from the plains.

STICTIA Illiger.

Males.

Middle femora smooth beneath ; pulvilli distinct ; second ventral abdominal segment without spines beneath . . . . . **pectifrons** Sm.
Middle femora carinated or spined beneath . . . . 1.
1. Second ventral segment unarmed ; pulvilli distinct . . **speciosa** Cress.
Second ventral segment with two small tubercles . . . . 2.
2. Pulvilli large, distinct ; larger ; femora mostly black. . **emarginata** Say.
Pulvilli small, indistinct ; femora black at base only ; smaller.
pulchella Cress.

Females.

Pulvilli small, indistinct (anterior wings beyond third abdominal segment) . . . . **pulchella** Cress.
Pulvilli large, distinct . . . . 1.
1. Dorsulum with a U-shaped yellow mark (legs mostly yellow).
speciosa Cress.
Dorsulum without a U-shaped yellow mark 2

2. Femora largely black; metanotum black; larger . . **emarginata** Say
Femora mostly yellow; metanotum in part yellow; smaller. **pictifrons** Sm.

Stictia pictifrons Sm.

Female, Livermore, Col., July 8, 1900.

Stictia emarginata Say.

Female, Livermore, Col., July 15, 1900.

Stictia speciosa Cress.

Female, Sterling, Col.; female, Lamar, Col.

Stictia pulchella Cress.

There are no specimens of this species in the collection, but it has been reported from Colorado by Fox, Cresson and Ashmead.

* * *

Synopsis and Bibliography of California Siphonaptera.

By M. B. Mitzmain, B. S.,

Entomological Laboratory, University of California.

The science of preventive medicine is growing apace with the commercial aggrandizement of the tropics and sub-tropics. It is leaving a profound impression on the very vitals of the economics. At present the Pacific metropolis, San Francisco, is in the throes of a sanitary upheaval conducted under the efficient guardianship of the greatest of exponents of preventive medicine, the U. S. Public Health and Marine Hospital Service. The campaign is a reactionary movement against the menace of the dreaded oriental plague. Science has pointed its finger at the flea as the specific carrier of the pest germ.

The recent epidemic has given the flea a recognition which makes it pre eminently notorious among insect foes. The following synopsis covers the species recorded in California. There are two species discovered on rats in San Francisco by Past Assistant Surgeon Fox, of the U. S. Public Health and Marine Hospital Service, which have not as yet been described. Dr. Fox is also responsible for the finding of [illegible] California gopher. The rat fleas herein recorded have been collected by the writer during an inspection of over two thousand rats from the San Francisco Bay region.

FAMILIES.

A. Rhynchoprionidae (head not strongly angulated anteriorly and thoracic segments not strongly shortened and constricted B.)

B. Pulicidae. (Spines on posterior tibia in pairs C).

C. Ctenopsyllidae.

A. RHYNCHOPRIONIDÆ.

1. Argopsylla gallinacea (Westwood) Enderlein.

1875. Westwood Ento. Mo. Mag. 31-246 (Sarcopsylla gallinaceus).

1901. Enderlein Zool Jahrb. Abth. f. syst. XIV-552 (Sarcopsylla gallinacea).

1904, Baker. Proc. U. S. Nat. Mus. XXVII-375 (Xestopsylla gallinacea).

On poultry and farm animals, occasionally man.

B. PULICIDÆ.

1. Anomiopsyllus californicus Baker (Hind coxal epiphysis narrowing into coxae with a poorly defined notch or none 2) 1904 Baker, Invert Pacif. i, 39.

1906. Baker Proc. U. S. Nat. Mus. XXIX, 140.

On the skunk *Spilogale phenax*.

2. Pulex irritans Linn. (Pronotum with ctenidia 4, or ocular bristle near upper border of eye 3).

1746. Linnaeus Faun Suec. 1695. '04 Baker, Proc. U. S. Nat. Mus. XXVII, 379.

('07. Mitzmain. Bull. Cal. State Board Health III, No. 5 p. 39).

The human flea found on man, poultry and rats.

3. P. cheopis. Roth., '03. Rothschild Ent. Mo. Mag. XIV, 85, Pallidus '07, Mitzmain Bull. Cal. State Board Health. III, 39.

Oriental rat flea on rats and occasionally other animals including man. The most important agent in the transmission of plague.

4. Ctenocephalus canis. Curt. (head without ctenidia 5) '04 Baker. Proc. U. S. Nat. Mus. XXVII, 384. '07 Mitzmain Bull. Cal. State Board Health. III, 39. Pulex 1826 Curtis, Brit. Ent. III, 8. The cat and dog flea. On man, domestic animals, and the brown rat.

5. Hoplopsyllus anomalus. Baker (Pronotal ctenidia with more than nine spines 6) '06. Baker Proc. U. S. Nat. Mus. XXIX, 130-144. Pulex '04. Baker Proc. U. S. Mus. Nat. Mus. XXVII, 381. On California ground squirrel. *Citellus beecheyi.*

6. Ceratophyllus acutus. Baker (Apical spur of second joint of hind tarsi scarcely or not exceeding third 8. Eyes vestigial, second genal row with five bristles 7).

'04. Baker Invert. Pacifica I-40.

'06. Baker Proc. U. S. Nat. Mus. XXIX, 135, 146.

On California Ground Squirrel *Citellus beecheyi.*

7——— ignotus, '04. Baker Proc. U. S. Nat. Mus. XXVII, 388, 410, 443, 458, '06. Baker U. S. Nat. Mus. XXIX, 134.

On California pocket gopher. *Thomomys bottae.*

8——— abantis Roth. (The normal basal pair of lateral spines on last joint of hind tarsi dislocated toward the median line to-or labial palpi, extending beyond coxae 9) '05 Roth. Novit. Zool XII, 164.

'06. Baker Proc. U. S. Nat. Mus. XXIX, 132, 146, 161, 164.

9.———proximus Baker, '04. Baker Proc. U. S. Nat. Mus. XXVII, 412, 446. On ground squirrel. *Citellus sp.*

10.———sexdentatus Baker (Hind femora with row of spines 11) '04 Baker Proc. U. S. Nat. Mus. XXVII, 403, 448. On brush rat, *Neotoma sp.*

11.———californicus. Baker (First joint of middle tarsi not distinctly longer than second 12) '04. Baker Proc. U. S. Nat. Mus. XXVII, 395, 440. On field mouse, *Microtus californicus.*

12.———ciliatus. Baker (A single row of bristles on ventral abdominal segments 13) '04. Baker Proc. U. S. Nat. Mus. XXVII, 402, 441. on chipmunk, *Eutamias sp.*

13.———fasciatus. (Bosc), Curtis, '07 Mitzmain Bull Cal State Board Health III, 39. Pulex '01 Bosc d'Antic. Bull. Sci. Soc Phil III No. 44, 156. European rat flea. On rats and mice and occasionally on other animals and man. Demonstrated to be an agent in the conveyance of bubonic plague on the Pacific Coast.

C. CTENOPSYLLIDAE.

1 Ctenopsyllus musculi (Duges) Wagner.

1898 Wagner Horae Soc. Ent Ross XXXI, 577

Pulex 1832 Duges Ann. d'Sci. Nat. XXVII, 164. The European mouse flea—on rats and mice.

* * *

We have received an interesting letter from Dr McCook. He says "I have just finished the MS of my book—'Ant Communes and How They Are Governed; A Study in Natural Civics.' It will be issued next spring by Harpers, who printed my 'Nature's Craftsmen' a year ago. In connection with the first part of that book it will complete my popular studies of ants, giving a summary of my long observations and bringing the leading facts of their known habits up to date. My first printed studies were of the Pennsylvania carpenter ant, *Camponotus pennsylvanicus*, and appeared in the Transactions of our American Entomological Society, December, 1876, thirty-two years ago.' Ah what changes in that generation. Next year is our fiftieth anniversary. Should we celebrate the semi centennial? We should at least have a special historical number."

Standards of the number of eggs laid by Insects—.VII[*]

Being averages obtained by actual count of the combined eggs from twenty (20) depositions or masses.

By John J. Davis, Office of State Entomologist, Urbana, Ill.

The following table gives the actual counts of the numbers of eggs in twenty egg-masses of *Pseudococcus citri*. They were collected on *Salvia* in a greenhouse at Urbana, Illinois, March, 1907. The table shows a wide range in the numbers per egg-mass, namely: 147 to 414; but, as will be seen in the successive averages, there was little divergence from the final average.

The "corn" or clay-colored eggs are laid in a mass beneath and spreading beyond, the tip of the abdomen in an entanglement of white cottony secretion. They are elliptical-oval, somewhat glossy, and measure 0.309 to 0.326 mm. in length, and 0.146 to 0.180 mm. in width. The average, from 15 eggs measured, was .0313 mm. in length by 0.164 mm. in width.

8. Pseudococcus citri (Risso).

No.	No. counted per mass	Successive Totals	Av. per Egg mass	Max.	Min.	Range
1	354	354	354.			414
2	346	700	350.			
3	210	910	303.3			
4	157	1067	266.6			
5	414	1481	296.2	414		
6	208	1689	281.5			
7	346	2035	290.7			
8	302	2337	292.1			
9	166	2503	278.1			
10	319	2822	282.2			
11	292	3114	283.1			
12	159	3273	272.7			
13	391	3664	281.8			
14	180	3844	274.5			
15	206	4050	270.			
16	399	4449	278.1			
17	266	4715	277.3			
18	147	4862	270.1		147	
19	292	5154	271.2			
20	329	5483	274.1			147
20		5483	274.1	414	147	267

---

[*] "This series will hereafter contain independent articles by myself and Mr. J J. Davis, who has consented to include such studies along this line that he may make from time to time, in order to bring them together under the same general heading for the convenience of bibliographers and others. No. VII is Mr. Davis' first of this series. For similar studies by Mr Davis on *Samia cecropia* Linnaeus, *Pulvinaria innumerabilis* Rathvon and *Culex pipiens* Linnaeus, see Ent. News, 1906, pp. 368-369.

For the first six of this series, see Ent. News, 1901, p. 305; 1904, pp. 2-3; 1905, p. 167; 1906, p. 6; 1907, p. 89, and 1908, p. 4.—A. A. Girault."

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., OCTOBER, 1908.

It is held that about 999 house-flies in every thousand breed in horse excrement, and horse excrement is manufactured in and around stables. House-flies have several important functions; they make the bald-headed individual wonder whether life is worth living and wipe their dirty feet all over the jam and other articles of food. They are not a bit particular where they walk and are just as likely to wade into a *Bacillus typhosus* discharge as anything else. It costs from five to three hundred and fifty dollars to screen a house, and we think a law something like the following would be appropriate: An Act. Be it enacted etc., That on and after this date stable owners shall supply and pay for all window and door screens for their neighbors' houses within a radius of one-quarter of a mile from said stable or stables. Be it further enacted, that no stable owner be allowed to screen his own home and that he be compelled to eat house flies in his cake in lieu of raisins, pay all doctors', druggists' and undertakers' bills when any of his neighbors die of typhoid fever or kindred diseases. There shall be no other penalties enforced

* * *

TACHOPTERYX (ODONATA) IN VIRGINIA.—On June 12th, I took two specimens ♂ and ♀ of *Tachopteryx thoreyi* at Great Falls, Va., [illegible] in the morning, the other at 4 P.M. Both were resting [illegible] trunk of tree. Several places near by where the water [illegible]. Neither specimen was hard to capture. On June 25th at Great Falls, I again took *Tachopteryx thoreyi*, 2 ♂ and 1 ♀; the latter [illegible] a log [illegible] the path, others on trees. Not hard to catch. Saw two or three more. NATHAN BANKS.

Entomological Literature.

INHERITANCE IN SILKWORMS, I. By Vernon L. Kellogg, Professor of Entomology and Lecturer in Bionomics, with the partial collaboration of Ruby Green Smith, former Instructor in Entomology Leland Stanford Junior University Publications, University Series No. 1.

This is a work of 89 pages and four plates. For a number of years Prof. Kellogg has given much study to the biology of the silkworm and this important paper is one of the results of his investigations.

INSECT STORIES. By Vernon L. Kellogg. Published by Henry Holt & Co., New York. Price by mail, $1.62.

Professor Kellogg has, in this volume of strange, true stories, succeeded in describing the habits of certain insects in so fascinating a way that there are few people, either old or young, who will not be held by its charm. Simplicity is the keynote to the studies and observations of the old scientist and the little girl who figure in the book, and their ingenuousness and the subtle humor, hold one's interest as much as the marvelous doings of the little ground folk themselves.

It is a splendid illustration of how interesting a book of natural history stories may be, while yet purified of all "nature faking" and of all the exaltation of animal hero-composites so popular in recent years.

THE MOUND-BUILDING PRAIRIE ANT. By T. J. Headlee and G. A. Dean. Kansas State Agricultural College (Agricultural Experiment Station) Bulletin 154 (April, 1908).

It is quite pleasing to see an original and interesting piece of work from an Agricultural Experiment Station. This paper tells the life of *Pogonomyrmex occidentalis* Cresson in a concise and graphic way and the species is of considerable economic importance as its mounds must be a great nuisance to farmers in some sections of the country. The half-tone illustrations are excellent, but lose much of their effectiveness by not being printed on plate paper. We consider this a model short paper and would be delighted to see more like it from our Experiment Stations. The article purports to be under the joint authorship of T. J. Headlee and George A. Dean. Mr. Headlee is entomologist and Mr. Dean assistant entomologist to the Station. A foot note says: "The work on this bulletin as printed was independently planned and executed Mr. Dean, who also made the photographs for illustrations." It therefore appears that Mr. Headlee had nothing to do with the work. This is therefore a most reprehensible piece of officialism and a kind of piracy that we thought had ceased to exist.—H. S.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

C. F. **Baker** is returning to Claremont, California, as Associate Professor of Biology in Pomona College.

After September 1, 1908, my address will be Bussey Institution, Forest Hills, Boston, Mass.—W. M. **Wheeler**, Professor of Economic Entomology, Harvard University.

Sphaeridium scarabaeoides, Linn. in Ohio.—August 22, 1908, while collecting near Ira, Summit County, Ohio, I found numbers of the above introduced beetle. It was swarming in piles of fresh cow excrement.—**Charles Dury.**

The trustees of the Massachusetts Agricultural College at Amherst have voted to establish a graduate school with Professor Charles H Fernald as its head. It will confer degrees of master of science and doctor of philosophy.

Junonia coenia.—While collecting near York, Maine, on August 19th, I saw (within five feet) but failed to secure, a fresh specimen of *Junonia coenia* Hbn. It was darker in color than specimens taken on Long Island and in Connecticut, resembling rather the dark specimens often seen in southern Florida. I do not know whether its occurrence so far north has been recorded previously.—W. C. **Wood**, New York

Dr. W. J. Holland wearing decorations conferred upon him by Emperor William of Germany and President Fallieres of France. Dr. W. J. Holland, former chancellor of the Western University of Pennsylvania and now director of the Carnegie Museum, has been honored by both the Emperor of Germany and President Fallieres of the French Republic, who conferred upon him the orders of the Knight of the Crown and Officer of the Legion of Honor. He is the first Pittsburger and the first man in the United States to be doubly honored in this manner

Dr. Holland will rarely wear these orders in public In Europe at public occasions it is the custom to wear all such decorations. In America it is not customary, and so Dr. Holland will only wear them on special occasions

The Royal Prussian Order of the Knight of the Crown, is a cross of white enamel inscribed, "Gott Mit Uns." The order was founded by Emperor William in 1861

The cross of Officier de la Legion d'Honneur is a five pointed cross bound in gold It differs from the original form of the cross as it was first fashioned in the days of Napoleon I, as France is now a republic.

Dr Holland is known to all entomologists through his valuable books and papers.

THE LITTLE MEN OF SCIENCE.—Lord Rosebery's character sketch of Lord Kelvin was fine and felt. "What most struck me was his tenacity, his laboriousness, his indefatigable humility. In him was visible none of the superciliousness and scorn which sometimes embarrass the strongest intellects. Without condescension he placed himself at once on a level with his companion. That has seemed to me characteristic of such great men of science as I have met." We have often wondered how it is that while the great men of science—the Darwins, Kelvins—are like this, the smaller men, the men who have never originated anything but have merely tried to suck in the ideas of the masters, so often are impatient, spiteful, jealous, assertive, impressed as profoundly by their own superiority as by the stupidity of nine-tenths of humanity. That this is the attitude of the lesser fry of science, its sticklebacks and tadpoles no one will deny. The little scientist is almost invariably too clever by half. He hangs up pictures of Darwin in his study. His talk is of Darwin. Yet he has as little of the heart as he has of the brain of that great master.—*From the Saturday.*

DR. ALFREDO DUGES, of Guanajuato, Mexico, has sent a wasp to the U. S. Bureau of Entomology, which has been determined by Mr. J. C. Crawford as *Polistes carnifex* Fabr. It is a male specimen. Concerning this insect Doctor Duges writes:

"In a metal box you will find a yellow hymenopterous insect, the only one which I have been able to obtain, for the people of the country have such a fear of it that I can engage no one to collect it. It is by chance that the individual which I send you has been found dead. It comes from Barranca de Ahüijillo, south of the State of Jalisco, on the border of Michoacan. They call it Ahorcadora (strangler) or Emborrachadora (that which intoxicates), because its sting occasions a rush of blood to the head, violent fever, and a sensation of strangulation. It is said that death arrives in a quarter of an hour if the wound is not sucked. This insect is, then, a curious one from the point of view of the fright which it causes. You know how prejudiced country people are, so that no one can never tell the exact degree of truth there is in such stories."

FIGHT MOTHS WITH LIGHTS.—Saxon Authorities Adopt Novel Plan To Protect Forests From Pest.—Zittau, Germany, August 8.—The Saxon authorities have discovered what seems to be an excellent way to put an end to the caterpillar plague which is ravaging local forests, by a method of catching the brown nun moths that lay the eggs from which caterpillars come in enormous quantities.

They make use of an electric light lamp, consisting of two powerful reflectors placed over a deep receptacle, and powerful exhaust fans, erected on top of the municipal electric plant. At night two great streams of light are thrown from the reflectors on the wooded mountain sides half a mile distant. The results have been astonishing. The moths, drawn by the brilliancy, come fluttering in thousands along the broad rays of light, until near the reflectors, when the exhaust fans, with powerful currents of air, swirl them down into the receptacle. On the first night three tons of moths were caught. It has been decided to build another trap on the Rathhaus tower, and the fight with the moths will be continued.

The forests of central Europe have from time to time been ravaged by moths from Russia, whose larvae denude the trees of their foliage. The splendid pines of the Lausitz Mountains are this year threatened with destruction.—*Newspaper.*

DR. C. L. MARLATT, *Bureau of Entomology, United States Department of Agriculture, Washington, D. C.*

DEAR DR. MARLATT: A little over two weeks ago there was a very marked migration of butterflies that took place in this vicinity, M[illegible], Fla., in early June. For a week or two from daylight to dark the air was full of butterflies,* resembling closely the cabbage butterfly, flying south. They usually flew fairly close to the ground, rarely ascending higher than the tops of the trees, mostly keeping within ten feet of the ground. The belt extended from the shore westward to the [illegible] glades, and possibly out into the everglades, which were dry at that time, but they were present in the greatest numbers within half a mile of the shore. Apparently the same migration was noticed about [illegible] miles north of here along the Indian River, and on a trip I made to Key West at the time, I found that the butterflies were present in great numbers on the line of Keys extending south and southwest from the east coast of Florida. They were still keeping up the southerly flight on Key Largo. However, only a few were seen as far south as Knight's Key, the terminus of the railroad, and these, instead of continuing out over the water, seemed to be flying over the land in a more or less confused manner. At the time the swarm was about the greatest Mr. Fawcett (my scientific assistant) made observations on the number passing and found that in a space [illegible] 300 passed on the average in five minutes, making about [illegible] an hour crossing a line a mile long, since they were flying from morning till dark, it would mean that probably over a million and a half would cross such a line a day. As this was kept up for [illegible] three weeks you may imagine what a number of butterflies [illegible] passed. I am sending you a small box containing a few that Mr. [illegible] collected at that time. A few butterflies of apparently the [illegible] species are still around.

Very truly yours,

ERNST A. BESSEY,

Pathologist in Charge, Subtropical [illegible]

[illegible] I once read in the NEWS from the [illegible] Trumbull [illegible] of how he worked an old log [illegible] interesting [illegible] he made. May [illegible] [illegible] The [illegible] wood was damp and fungus grown

---

**Pieris monuste.*

rusty red color. The log and roots were honeycombed by several species of ants. I worked May 17th, 19th and 22nd crumbling and sifting this log; every inch of it was worked over. I found it a veritable mine of coleopterous treasures. I took more than 300 beetles from it, a number of which are new to me. It was swarming with *Pselaphidae, Scydmaenidae* and *Trichopterygidae*. Maj. Casey has described three species of these *Pselaphidae* in Can. Ent., August, '08. Many of these beetles were exceedingly minute, such as *opressus, luteus* Csy. and *Leptoplectus exilissimus* Csy. being the smallest of their respective families. The little Tenebrionid, *Dioedus punctatus* Lec. was in numbers, those freshly hatched being pale, while the mature ones were jet black. This species can generally be found in red rotten wood. I collected only the coleoptera, though other orders were numerously represented. The proper conditions as to season, degree of moisture and food were present in this log, a combination of conditions not always to be had together. When a collector finds such a favorable combination, the locality should be worked until exhausted. In the language of the Hoosier schoolmaster, "While your gittin', git a plenty." In a locality that has been so thoroughly gleaned as Cincinnati, it is only by patient search for the small forms that new species can be found.—CHARLES DURY.

DEALS DEATH TO THE FLY.—French Surgeon Has Preparation That Is Terrible and Certain.—Doctor Delamarre, an eminent army surgeon, has just published the result of his investigations concerning the contagion-bearing qualities of the ordinary housefly. Without hesitation he condemns that familiar insect to death. He points out that numerous plans for executing this sentence have been evolved by scientists of all times and every country, but flies are apparently as numerous as ever.

He suggests a mixture composed of one part formol to nine parts of water. This may be put in ordinary plates, and placed wherever flies are likely to congregate. Twenty-four hours later, says the doctor, not only the plates themselves, but a considerable space around them, will be covered by flies and mosquitoes which the mixture and emanations from the mixture have poisoned. The insects are attracted by the solution as though it were sugar. To be perfectly effective it should be changed every twenty-four hours.—*Newspaper.*

* * *

Doings of Societies.

PHILADELPHIA, June 17th, 1908.

At the meeting of the Feldman Collecting Social, held at the residence of Mr. H. W. Wenzel, fifteen members were present.

A letter from Professor Philip P. Calvert was read, in which he stated that he had examined the scale insects exhibited at our last meeting, and found them to be the San Jose scale; slides were also shown.

Mr. H. W. Wenzel read a communication from Mr. Wm. D. Kearfott, with reference to *Evetria wenzelli*, a new species bred on Jersey Pine, *Pinus virginiana* Mill.

Mr. H. W. Wenzel stated that after having read Mr. Manee's article in "News," p. 286, '08, in which reference is made to the habits of *Strategus antaeus*, he had found the said species at Malaga, N. J., under the same conditions as stated in this article; Mr. Wenzel said that this is the westernmost point at which he had collected this species.

Mr. Geo. M. Greene exhibited specimens of *Mygale avicularia*, "Bird-killing Spider," from Para, Brazil.

Mr. Geo. M. Greene reported the finding of larvae of *Trichius piger* at Castle Rock, Pa., on April 17th, 1908, in dead oak. The larvae pupated on April 19th, and the imagos appeared on April 27th.

Mr. H. W. Wenzel suggested the planting of little twigs along the edges of lakes, say two feet above the water, for the purpose of collecting Odonata.

Mr. C. T. Greene reported captures of the following Diptera: *Theresia tandroc* Desv., 58 specimens in two days, by Geo. M. Greene, and C. T. Greene, at Malaga, N. J., August 4th and 5th, 1907. *Sphegina keeniana* Will., by Frank Haimbach, at Roxboro, Phila., Pa., May 17th, 1908. *Dexia vertebrata* Say, at Lehigh Gap, Pa., July 13th, 1907. *Symphoromyia hirta* Johnson, at Roxboro, Phila., Pa., May 31st, 1908. *Sphecomyia vittata* Wied., by Geo. M. Greene, at Unionville, Phila. Co., Pa., May 3d, 1908, and *Palloptera superba* Loew, by Geo. M. Greene, at Roxboro, Phila., Pa., June 7th, 1908.

Mr. Daecke exhibited a specimen of *Lapara coniferarum* S. & A., bred from a larva found at Brown's Mills, N. J., in October, and which emerged on June 2d, 1908.

FRANK HAIMBACH, *Secretary.*

A meeting of the Newark Entomological Society was held March 9th with sixteen members, and Dr. H. D. McCormick a visitor, present. Mr. Edwin Holden, of Newark, was elected to membership.

Mr. Wasmuth exhibited specimens of *Hyperchiria pamina*, *Attacus jorulla* and *Eacles imperalis* var. *didyma;* also two fine variations of *Philosamia cynthia*, in which the lavender posterior-transverse cross line was three times the ordinary width and without a defined internal edge; the angular anterior-transverse line, also, was unusually broad, much further removed from the base of the wing than ordinarily and connected with the t. p. line, forming therewith a well-shaped K. In consequence of the abnormal breadth of the t. p. line the discal lunules were deeply inserted into it. Altogether, they were widely remote from the normal type. These specimens were bred from cocoons collected in the vicinity of Brooklyn.

Mr. Kircher showed a box of Hymenopterous parasites bred from chrysalids of *Papilio turnus*. From twenty-four pupae collected at random, he obtained one perfect butterfly, one crippled example, seventeen *Psilomastex exesorius*, and, from two, a multitude of Chalcids. The remaining three pupae were hard and dry. He also exhibited a box of *Catocala*, showing the range of variation in *relicta, amatrix, parta, unijuga, habilis* and *basalis*.

Mr. Wormsbacher reported the following species of Lepidoptera from New Jersey:

Acronycta modica, Guttenberg, June 30th.
Sarrothripa lintnerana, Guttenberg, July 30th.
Hadena diversicolor, Edgewater Heights, September 10th.
Euxoa velleripennis, Guttenberg, August 20th.
Feltia volubilis, Guttenberg, May 25th.
Mamestra congermana, Fort Lee, July 30th.
Lithomia napae, Forest Hill, April 20th.
Scopelosoma morrisoni, Forest Hill, April 4th.
Polychrisia formosa, Edgewater, August 4th.
Eutolype rolandi, Forest Hill, April 11th.
Cossus centerensis, Guttenberg, June 30th.

He also read a paper on the occurrence of *Chlaenogramma jasminearum* at Fort Lee, N. J., where in certain years the species was collected in the egg and larvae stages in numbers, but in other years was entirely absent. He believed that the species was a southern one and that it is unable to maintain itself in a northern latitude. The periodical occurrence of the larva he explained by the supposition that the impregnated females migrated northwardly and laid eggs which developed mature larvae. The pupae, however, are unable to survive the winters and consequently another brood would depend on another chance wanderer.

This supposition lacked the support of the other members who believed that if the species were truly a migrant, it would not continually pass over certain regions harboring its food plant immediately to the south of Fort Lee, where the insect had been often searched for but never found. It would be more reasonable to suppose that in the off years the species was reduced almost to extinction by parasitism, and that it took several years to again multiply to noticeable numbers.

Mr. Erhard showed specimens of *Phlyctaenia profundalis* Pack. (Lep.) and *Eleodes grandicollis* Mann. (Col.) taken alive at Newark, N. J., from celery imported from California and a number of living Conacephalids shipped with the same product from Florida.

JOHN A. GROSSBECK, *Secretary*.

A meeting of the Newark Entomological Society was held on April 12, with twenty-one members present, and Messrs. Chas. Roberts, of Connecticut; Henry Dietz, of Newark, and Chas J. Martin, of Brooklyn, visitors. Dr. H. D. McCormick, of Little Falls, was elected a member.

Mr. Roberts addressed the Society on how and where to collect aquatic Coleoptera. Of first importance is a strong rimmed net, perfectly rigid, and capable of resisting a dense vegetation. Deep water harbors little beetle life, but water several inches in depth or less is exceedingly prolific, and in using the net it is best to begin as far out from the shore as the shallow water extends and work inward. It is a habit of the insects to dart away from the pursuer into deep water if the opposite method is followed. If a long bag is used the contents need not necessarily be examined after each sweep, but when a considerable quantity of matter is accumulated it may be spread upon a piece of cloth, carried for the purpose, upon the shore, and when ten minutes or so has elapsed the beetles will leave the drying mass—sometimes by the hundred. One of the best places to collect is along the edges of shallow water areas among the vegetable mould and old leaves. The material is swept up with a net, placed on a cloth as above described, and broken up into small pieces in order that dessication may begin promptly. At first the mass may seem devoid of life, but as the material becomes dry, the beetles will begin to emerge. In this way Mr. Roberts has taken hundreds of *Hydroporus difformis* which until then had been regarded as an extremely rare insect. To collect in flowing streams a loosely woven cloth should be stretched across and through the stream, and the stones, gravel and sand overturned and stirred up a short distance above it. The dislodged beetles will be swept into the cloth to which they will cling for support, and it is only necessary to draw up the cloth and reap the harvest. On one occasion Mr. Roberts collected by actual count seven hundred beetles in this manner after stirring up about two feet of sand and gravel.

He also spoke of the absolute necessity of mounting small aquatic Coleoptera from the side, *i. e.*, by bending the tips of the point downward at an angle to conform to that of the side of the beetle and attaching the specimen in such a way as to leave the center and one-half the under side free. Color is often deceiving in the identification of water beetles; but the characters on the underside are good and reliable, hence the necessity of this method of mounting.

Mr. Brehme exhibited a box of *Hemileuca electra*, showing the tendency toward black individuals, and Mr. Wasmuth exhibited a specimen of *Telea polyphemus* with almost black secondaries.

Mr. Doll showed specimens of *Papilio acauda* Oberth. and spoke of the differences between that species and *P. philenor.*

JOHN A. GROSSBECK, *Secretary.*

OBITUARY.

PROF. PAUL BIOLLEY.

Among the numerous naturalists which Switzerland has given to the world the late Paul Biolley occupied a noteworthy place. Born at Neufchatel, February 15, 1862, the son of Prof. August Biolley, he studied in his native city, taking his degree in letters. In 1885, after teaching two years in Holland, he was selected with two other compatriots, by the government of Costa Rica to organize in the capital of that republic a college—the "Liceo de Costa Rica." There he remained many years, also occupying a professorship at the Girls' College—"Liceo de Señoritas," as well as teaching in the city of Cartago. In the years of his teaching he trained many young men who are now prominent citizens of the republic of Costa Rica.

Prof. Biolley's right to our recognition rests, however, not upon his work as a teacher, but upon years of indefatigable natural history field work in his adopted country, the invertebrate fauna of which he undoubtedly knew better than any living man. Soon after his arrival in the country he began studying its natural history, preparing collections of botanical specimens, insects, reptiles, etc., his spare time for years being thus occupied. His excursions yielded material of very great value and the results enriched the two scientific institutions of the republic, the "Instituto Fisico Geográfico" and the [illegible] National," while collections of great value were sent to specialists and museums in Europe and the United States. His work was continuous, from early morning until late at night, both in the field and in his room. All of his excursions, even those to distant places, were made on foot and his work was not merely collecting, but with his keen powers of observation he noted many facts concerning the life of the animal and the labels placed by him on his material bear witness to the intense interest he had in his work.

He maintained a valuable correspondence with prominent naturalists and his numerous collections sent to them gave rise to a number of publications, forming, no doubt, the most complete series of papers on the natural history of Costa Rica

Through his work many new species were made known to science and a considerable number were named after him. The peculiar roach, *Biolleya alaris,* taken by him, was dedicated by the late Dr. Henri de Saussure in recognition of his work. Several books on botany and zoölogy were published by him, while numerous zoölogical papers came from his pen, one of the last being a study of the mollusca of Cocos Island. On public instruction his opinion was held in high esteem and among other things he published a Greek and Latin grammar for use in the Costa Rican schools. For the Paris Exposition of 1900 he prepared an interesting and unbiased work on Costa Rica, and he was the mainstay of the National Society of Agriculture, contributing valuable papers to every Bulletin published. Death came just as he was preparing a resumé of his twenty-one years of continuous work and study, and, as he was a man of order, it will be possible at any time to publish the work. His demise occurred at San José, January 16, 1908, from pneumonia.

Personal knowledge of Prof. Biolley's work compels us to pay some tribute, in addition to the facts given above, if only in return for the very valuable collections which he transmitted to us for study, work on a particularly extensive sending having occupied our attention when news of his death reached us. With the greatest generosity and most hearty spirit of co-operation this energetic and enthusiastic colleague sent specimens, lot upon lot, unconditionally, supplying most complete capture notes, while at the same time he stirred up and sustained interest in the same field in others around him. We who have good libraries and abundant opportunities to do that in which we are interested, do not fully realize and appreciate what devotion and energy in the cause are necessary to produce a man like Paul Biolley under the circumstances in which he worked.

Most of the notes in the above article concerning Prof. Biolley's life have been very kindly furnished by his intimate colleague, Prof. J. Fidelio Tristán, of San José, and E. H. Lankester, Esq., who during his residence in Costa Rica, became acquainted with Prof. Biolley. The portrait was kindly supplied by Prof. Tristán. J. A. G. R.

SIMON H. M. SEIS

It is with the deepest regret that we record the death of Simon H. M. Seib, of Jersey City, who died at his home on August 27th. Mr. Seib was an ardent collector and breeder of Lepidoptera who took great pains in mounting his specimens. He was one of the original members of the Newark Entomological Society; was its first president and held the office of treasurer at the time of his death.

MONSIEUR P. A. P. FINOT.

In the death of Monsieur Pierre Adrien Prosper Finot, systematic entomological science has lost one of its most devoted adherents. He was "Chevalier de la légion d'honneur" and "Capitaine d'état major en retraite." A most befitting tribute to his memory printed by his relatives in the form of a memoriam has been sent out to his correspondents in foreign lands. Monsieur Finot was 70 years old at the time of his death, April 14, 1908, and he lived at Fontainebleau, 27 Rue Saint-Honoré. His published papers were mostly devoted to Orthoptera. His monographs were prepared with painstaking care and were often embellished with exquisite drawings made by his own hand. His plates and figures were works of art, showing a great refinement of the art sense as well as close devotion to his subject.

He will be remembered more, perhaps, by his well-known monograph on the Orthoptera of France, which is a model of its kind, though his other works are none the less valuable contributions to Orthopteran literature. He was always kind and courteous toward correspondents, and his letters indicate a man of sympathetic scientific feeling.

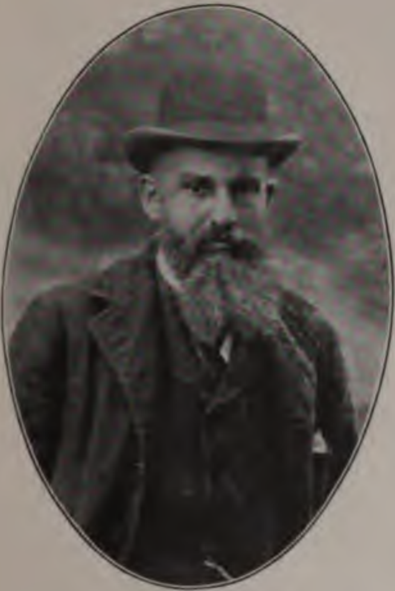
J. L. Hancock.

Biological Experiment Grounds, Lakeside, Berrien
Co., Michigan, July 9th, 1908.

◆

PROF. GUSTAV MAYR.

Professor Dr. Gustav Mayr, the distinguished Hymenopterist and special student of the Formicidæ, died July 14th, 1908, at his home in Vienna, after a prolonged illness, in his 78th year.



THE LATE PROF. PAUL BIOLLEY.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted.—Correspondence with those desiring to exchange Lepidoptera this season. Living pupae also to exchange or sell in November.—A. F. Porter, Decorah, Iowa.

Lepidoptera.—Wanted parties to exchange specimens not native to New England. Write for offers.—Will Place, Jr., 13 Parkes Ave., Providence, Rhode Island.

Will collect in all Orders, in exchange for Lepidoptera—American and exotic.—P. A. Schroers, 3807 Folsom Ave., St. Louis, Mo.

I have a great many fine exotic species of Buprestidae in duplicates which I would like to exchange for North American Coleoptera.—G. Chagnon, P. O. Box 186, Montreal, Canada.

I have or shall have for exchange eggs, larvae and pupae of *T. modesta*, *Sm. geminatus*, *Dolba hylaeus*. *P. ajax*, *P. cresphontes*, *Catocala vidua*, *illecta*. *cara*, *palaeogama*, *habilis*.—R. R. Rowley, Louisiana, Mo.

I want *Pachybrachys* of North America, either by purchase or exchange. Correspondence solicited —Fred. C. Bowditch, 164 Rawson Rd., Brookline, Norfolk Co., Mass.

I want to buy eggs of *Papilio ajax*, *turnus*, *cresphontes*, *asterias* and *Telea polyphemus* and *A. luna*. Will pay 6 cts. per dozen. Write to me before sending.—Sydney L. Wright, Jr., Logan, Phila., Penna.

Scarabaeidae of North America wanted for cash. Send price lists to W. C. Wood, 51 Fifth Ave., New York.

I have larvae of *Catocala illecta* feeding on honey-locust, and shall have chrysalids in a few weeks. From eggs of *C. piatrix* and *C. vidua* shall soon have larvae. Larvae of other later. Want *C parta* and *C. amatrix*.—R. R. Rowley, Louisiana, Mo.

Wanted.—Parties to exchange Lepidoptera not native to New Engand for New England specimens. Write for offer to Will Place, Jr., 13 Parkes Ave., Providence, R. I.

Some Entomological Literature for exchange.—M. Bubna, 2629 Woodhill Rd., Cleveland, Ohio.

I'll be happy in corresponding and exchanging papers and material of study with economic entomologists, and especially with Miriopodologists and Acarologists.—Prof. Carlos E. Porter, Casilla 2352, Santiago, Chile.

For Exchange.—A subscription to the Macrolepidoptera of the world by Seitz. All parts complete to date.—Chris. E. Olsen, No. 1 Jefferson Ave., Maspeth, L. I., N. Y.

Wanted for Cash or Exchange.—Cocoons and pupae: *Pap. ajax*, *troiulus*, *cresphontes*, *achemon*, *turnus* and other *Papilio*. *T. modesta*, *H. chersis*, *luscitiosa*. *A. bicolor*, *angelica*, *P pandorus*, *Dar. versicolor*, *Cal. astylus*, *Cit. regalis*. *imperialis*, *hylacus*, *luna*, *polyphemus*. *Lapara coniferarum*. *C. nudulosa*, *S. germinatus*. *Paonias myops*, *P. quinquanmaculata*, *Attacus cecropia*, *jorulla*, *orizaba angulifera* and all other species of *Attacus*.—Joseph Sever, 335 E. 49th St., New York City.

I have for exchange cocoons and pupae of *P podilarius*, *machaon*; *Sphinx ligustri*, *pinastri*, *euphorbiae*. *elpenor*. *porcellus*. *tiliae*. *occelata*, *populi*, *stellatarum*; *Saturnia pyri*. *pavonia*; *Aglia tau*; *End. versicolora*, *G. lanestris*, *Ph. bucephala*, *C. vinula*, *N. Ziczac*, and eggs of *Catacola fraxini*, *nupla*. *promissa*, *elocata* and *electa*.—Joseph Sever, 335 E. 49th St., New York City.

Wanted for Cash or exchange living pupae *Papilio turnus*, *tr[illegible]* *philenor* at 5c. each; *ex caecatus*, *geminatus*, *myops* at 5c each; *m[illegible]* 10c each; *lineata* at 5c., *jorulla* at 7c., *Dat. ministra* at 5c.—A. F. Porter, Decorah, Iowa.

Correspondence solicited with collectors who have been victimized by foreign dealers or collectors. Correspondence confidential [illegible] retribution.—Address A. F. Porter, Decorah, Ia.

Wanted.—Henshaw's Check List of Coleoptera. Will pay cash. [illegible] S. Woglum, Whittier, California.

Lepidoptera Wanted.—Catocala, Papilio, Arctians and other [illegible] specimens of larvae. Will send equally good things in return. [illegible]hard, Berlin, Friedenau, Beckerstrasse [illegible] Germany.

INSECTS OF NORTH CAROLINA

I am desirous of securing accurate data concerning occurrence of all species of insects in this State. Correspondence desired with parties or institutions having North Carolina material. Willing to pay for accurately prepared [illegible] of any considerable number of species. Correspondence wanted with those desiring material in certain groups from this State. Will gladly give suggestions to persons desiring to find suitable collecting grounds in this State for work at any season. In short, want the varied and interesting entomology of this State to be known and recognized by entomologists, and willing to assist in every way to make it known and get it recorded. About 300 miles of coast line and numerous mountain ranges and peaks 5000 to 6700 feet [illegible] touches of subtropical and boreal faunas and all intergradations. [illegible] mention this advertisement.

FRANKLIN SHERMAN, JR., Entomologist
State Department of Agriculture, Raleigh, North Carolina

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,
6, Gunterstone Road, West Kensington, London, W.
Cat. No. 17 for 190[illegible] now ready, mailed free on demand.

The only descriptive list giving authors' names throughout [illegible] ments [illegible] over [illegible] different species in papers [illegible] *Lepidoptera* [illegible] mailed free on receipt of Post Office Order [illegible] Catalogue with over [illegible] descriptions and many [illegible]

PARCELS SENT ON APPROVAL FOR SELECTION.

FOR SALE. COMPLETE SET OF EDWARDS BUTTERFLIES
Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

NATURHISTORISCHES INSTITUT "KOSMOS."
HERMAN ROLLE, BERLIN, W. 30, SPEYERER STR. 8

The Butterflies of the West Coast

A new book. Text, descriptive and critical, of all known species, illustrated with thirty-two full page plates in best modern photographic color work, with nearly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practically out of print; is not in any dealers' stock, and only a few copies now remain in the author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAST

An abridgement of the above, consisting of the full set of plates as issued in that book, with names of all species printed on pages facing the plates, but with no descriptive text; issued as the best possible substitute for that more expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book address the author.

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

WILLIAM J. GERHARD
SCIENTIFIC BOOKS

2209 CALLOWHILL STREET
PHILADELPHIA, PA., U. S. A.

OFFERS THE FOLLOWING:

Proceedings Entomological Society of Philadelphia. 6 vols. 1861-67. Complete. Half morocco. Scarce $50.00
——Same. A copy in original parts, lacking vol. ii, No. 3 . . . . . $45.00
Strecker, H. Lepidoptera, Rhopaloceres and Heteroceres, etc. 15 parts and 4 supplements. 4to. 1872–1900. 15 colored plates. Scarce. $20.00
Say. Complete writings of Thomas Say on the Entomology of North America. Edited by J. L. LeConte. 2 vols. 1859. Cloth. 54 col. pls. . $16.00
Saussure, H. de. Etudes sur la famille des Vespides. I. Guepes solitaires ou de la tribu des Eumeniens. 1852. 22 colored plates $5.00
II. Guepes sociales ou de la tribu des Vespiens. 1853. 37 col. pls. $7.50
III. Monographie des Masariens. 1856. Lacks plates. $2.50
Müller, H. Befruchtung der Blumen durch Insekten. 1873. With, Weitere Beobachtungen, 3 parts. 1879-82. . . . . $5.50

WANTED Instructor in Elementary Entomology for a Summer School for Boys. College graduate preferred.—C. A. Schenck, Pisgah Forest, N. Carolina

FOR SALE

The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, [illegible]; *C. arizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. horni*, .50; *Pasimachus mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. arizonicus*, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Moneilema gigas*, .40; *Oncideres tessellatus*, .75; *Leptostylus yuccæ*, 50.; *Urodera crucifera*, 20; [illegible] *arizonica*, [illegible]. Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus* [illegible], [illegible]; *Oxycnemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; [illegible], .40; *Spragueia plumbifimbriatus*, 25; *Halisidota zethus*, .75; *Triprocris rata*, .20; [illegible], .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North American insects of all orders for sale, or exchange furnished on application.

F. H. SNOW - - - LAWRENCE, KANSAS

The Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

Cocoons of HYPERCHIRIA PAMINA Neum.

and Var. AUROSEA Neum.

ARIZONA. FOOD PLANT, OAK. PRICE, $1.

Otto Buchholz, 382 Littleton Ave., Newark, N. J.

New Arrivals from Mexico, South Brazil and Java

Lot of 100 perfect, correctly named, specimens from Java, with bright colored species of *Euploea, Hypolimnas, Hestia, Neorina, Cethosia, Junonia, Kallima inachis* or *paralecta, Charaxes, Ixias,* etc., and 15 *Papilio* ([illegible] *gigon, arjuna* var. *gedeensis*), several varieties of the [illegible], etc., for $7.50.

Lot of 100 perfect, correctly named, specimens from Brazil or Mexico, with 10 *Papilio*, $7.50.

Special.—*Papilio pilumnus*, ♂, $1.50, ♀, $2.50; *asclepias*, ♂, $2.00, ♀, [illegible]; *pharnaces*, ♂, $1.00, ♀, $1.50. *Morpho epistrophis*, ♂, 60c., ♀, $1.00. *Caligo martia*, ♂, 75c., ♀, $1.00. *Kallima inachis*, 40c.; *paralecta*, 60c. *Attacus atlas*, **very large**, ♂, 75c., ♀, $1.00.

O. FULDA, 816 BROADWAY, NEW YORK

When calling at my New York Store, mention News to get special prices

JOURNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

Editor, E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec, Asso. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rogue, Louisiana

Advisory Board { L. O. Howard, S. A. Forbes, James Fletcher, H. A. Morgan, Herbert Osborn, H. T. Fernald

A bi-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

Terms of Subscription:—In the United States, Cuba and Mexico, two dollars annually in advance; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

JOURNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

BUTTERFLIES AND MOTHS

FOR SALE, CHEAP—A collection consisting of nearly 3000 named specimens representing an excellent lot of interesting exotics, as well as a good series of North American species, both diurnals and nocturnals.

Fred. M. Mueller, 167 Evanston Ave., Chicago, Ill.

1,000 PIN-LABELS, TWENTY CENTS!

Printed from the smallest type made. About 30 on a strip. No trimming—One cut makes a label. Send Money Orders. Orders must be in multiples of 500, and no order will be filled for less than 500 each of 2 labels or 1,000 of one.

C. V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

I AM LOOKING for collectors who deal with insects, pupae, butterflies and larvae from Mexico, Texas, Arizona and California paying cash. Regarding further information, communicate with JOSEPH SEVER, 335 East 49th Street, New York.

NOVA SCOTIAN INSECTS

LEPIDOPTERA—in papers—pinned—full data given—named—in finest condition—many rare kinds

100 specimens of 70 species, $6,00 **200 specimens of 140 species, $11.00**

Prices include cost of transportation
Named Lepidoptera, Diptera, Coleoptera and other insects of other Orders at very low rates

JOHN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September**, in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.
Outside of the United States and Canada, $1.20.
SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NEW Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

SPECIAL

Papilio androcles	[illegible]	*Ornithoptera brookeana*	[illegible]
" *blumei*	[illegible]	" [illegible]	[illegible]
" *buddha*	[illegible]	" [illegible]	[illegible]
" [illegible]	[illegible]	*Actias selene*, small but perfect	[illegible]
" *childrenae*	[illegible]	[illegible]	[illegible]

50 perfect specimens exotic Lepidoptera, in papers, all determined, 12 Papilios, including *Pap. blumei, Ornithoptera brookeana* **$5.00**

Antomerus pamina, per pair, **$7.00** **Crinodes biedermani,** per pair,

Extra fine specimens of *Phyllium siccifolium* [illegible]

Send 10 cents additional with each order to cover postage and packing.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA

I'll be happy in Corrsponding and Exchanging Papers and Material of Study with Economic Entomologists, and especially with Miriopologists and Acarologists.—Prof. Carlos E. Porter, Casillo 2352, Santiago, Chile.

CATALOGUE OF THE

NEUROPTEROID INSECTS

(EXCEPT ODONATA)

OF THE UNITED STATES

BY NATHAN BANKS

Complete to Summer of 1907 Price 50 cts. (net) per copy Mailed on receipt of

☞ Send for copy of New Additions to ☜
Price List; just issued.

E. T. CRESSON, Treas., P. O. Box 248, Philadelphia, Pa.

When Writing Please Mention "Entomological News."

THE LATE DR. WILLIAM H. ASHMEAD.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. NOVEMBER, 1908. No. 9.

CONTENTS:

Dr. Wm. H. Ashmead 397
Houghton—Coleoptera of St. Lawrence Co., N. Y. 399
Plitt—Collecting in Baltimore Co., Md. 402
Doane—Variations in the Wing Venation in some Tipulidae 405
Laurent—Notes on the early stages of some Pamphila 408
Rohwer—Four new Hymenoptera 417
Kwiat—One Day's Collecting, with a description of a new Noctuid 420
Slosson—A hunt for Saldoida Osborn 424
Williamson—A new Dragonfly (Odonata) belonging to the Cordulinæ, and a Revision of the Classification of the Subfamily 428
Fox—Ceratophyllus niger n. sp. 434
Editorial 436
Notes and News 437
Doings of Societies 439

Dr. Wm. H. Ashmead.

William Harris Ashmead died in Washington, D. C., October 17th, aged fifty-three years. He was descended from an old Philadelphia family and was born in that city September 19, 1855. His father was Captain Albert S. Ashmead and his mother Elizabeth (Graham). Educated in privatė and public schools, he received the degree of A. M. from the Florida Agricultural College in 1901, and the honorary degree of D. Sc. from the Western University of Pennsylvania the same year. While in Philadelphia he was with the large publishing house of J. B. Lippincott & Company, which he left in 1876 and with his brother established a publishing house in Jacksonville, Florida. They specialized in agricultural books and published an agricultural weekly journal and a daily paper. Dr. Ashmead edited the scientific department of the weekly, devoting himself chiefly to the investigation of injurious insects. His excellent work attracted attention, and in 1887 he was made a special field entomologist of the United States Department of Agriculture. From this time his career as an entomologist was rapid and he occupied the following positions: Entomologist, Florida State Agric. College (1888), Lake City, Florida; Assistant Entomologist and Investigator, U. S. Dept.

Agric. (1889). During the winter of 1890 he went abroad and studied in Berlin. After this he returned to the United States Department of Agriculture, and in July, 1897, was made assistant curator in the department of insects of the United States National Museum, which position he retained until his fatal illness. At various times he occupied important positions and was honored by different societies, having been a Fellow of the American Association for the Advancement of Science; corresponding member American Entomological Society; vice-president Biological Society of Washington; president Cambridge Entomological Society; president Washington Entomological Society; vice-president Washington Academy of Sciences; honorary member Entomological Society of Ontario; vice-president Association Economic Entomologists.

He was a prolific writer, his larger productions being Orange insects; a Bibliographical and Synonymical Catalogue of the Cynipidae; Hymenoptera of the Harriman Alaskan Expedition; Classification of the Ichneumonoidea; Parasitic Hymenoptera of the Island of St. Vincent; Monograph of the Proctrotrypidae; Classification of the Chalcid Flies and various classifications of the Hymenoptera published in the *Canadian Entomologist*. In all, he published over two hundred and fifty papers.

Dr. Ashmead had a profound love for entomology, and his great traits were enthusiasm and industry. He was clearly the leader of students of the Hymenoptera in this country during his career. He was thoroughly a gentleman, being courteous, generous and thoughtful of the rights of others. His manuscripts were always carried with him when he visited Philadelphia, as he never lost an opportunity to add to their completeness. As an officer of the United States National Museum he encouraged work among younger men and was quick to recognize ability and secure material to aid their studies. He had the general esteem and love of his co-workers and friends, and will be universally missed and mourned. In 1878 he married Harriet, daughter of Thomas O. Holmes, who, with a daughter, survives him.

Coleoptera of St. Lawrence Co., N. Y.—I.

By C. O. Houghton, Newark, Del.

The present list of beetles embraces only those species that have been taken by the writer in St. Lawrence County, N. Y., at odd times during the past fifteen years. No systematic collecting has been done at any time, and during the past nine years only my summer vacations—in some instances less than a month's time—have been spent in St. Lawrence County, and but very little of this time has been devoted to collecting.

This list is, therefore, very incomplete and some families, which should be represented by many species, are hardly represented at all. However, it is thought that the list, incomplete as it is, may be of some interest to collectors, and of value as giving some data relative to the geographical distribution of our Coleoptera; for so far as the writer is aware, no list of the beetles of this section of New York State has ever been published.*

The collecting has been done principally at Potsdam and in its immediate vicinity, but some excursions have been made into the Adirondack Mountains and their foot-hills at distances from Potsdam varying from ten to fifty miles. The village of Potsdam, which is situated in the township bearing that name, is in latitude 44 deg. 40 min., longitude 74 deg. 58 min. The length of the day at summer solstice is fifteen hours, thirty-nine minutes and fifty-eight seconds. The altitude above sea level is about four hundred feet. Potsdam is a place of about 4500 inhabitants, and is located on the banks of the Racket River. The surrounding country is typical of the farming section of northern New York. It is fairly level, with scattered pieces of woodland and occasional small brooks which usually have their sources in springs in the foot-hills of the Adirondack Mountains.

---

*In the "News" for October, 1902 (p. 247), Dr. A. D. MacGillivray and the writer published a list of Coleoptera taken at Axton, N. Y.; and in the "News" for Feb., 1905 (p. 50), the writer published a list of beetles collected by Dr. MacGillivray and himself on the summit of Mt. Seward, N. Y. These places are in Franklin Co., which adjoins St. Lawrence. None of the species which were collected only at these places are given in the following list.

My collecting has been done in the fields and woods and along roadsides and water courses, where some dredging has been done. No collecting with trap lanterns has been attempted, but a few specimens have been taken at various times at light.

The determinations of the species given in this list have been largely made by Mr. Chas. Liebeck, to whom my thanks are due; the writer is responsible for the remainder.

CICINDELIDAE.

Cicindela Linn.
- 6-*guttata* Fab.
- *purpurea* Oliv.
- *vulgaris* Say.
- *repanda* Dej.
- 12-*guttata* Dej.

CARABIDAE.

Calosoma Web.
- *calidum* Fab.

Elaphrus Fab.
- *ruscarius* Say.

Blethisa Bon.
- *julii* Lec.
- *multipunctata* Linn.

Notiophilus Dum.
- *semistriatus* Say.

Leistus Froh.
- *ferruginosus* Mann.

Dyschirius Bon
- *globulosus* Say.
- *sphaericollis* Say.

Schizogenius Putz.
- *crenulatus* Lec

Nomius Lap
- *pygmaeus* Dej.

Bembidium Lat
- *ustulatum* Linn.
- *picipes* Kirby
- *variegatum* Say
- *versicolor* Lec.
- *mutatum* G & H.
- *quadrimaculatum* Linn.
- *graciliforme*

Tachys Schaum.
- *nanus* Gyll.
- *incurvus* Say.

Pterostichus Bon.
- *adoxus* Say.
- *honestus* Say.
- *coracinus* Newm
- *lucublandus* Say
- *convexicollis* Say
- *caudicalis* Say.
- *corvinus* Dej.
- *mutus* Say.
- *vitreus* Dej
- *luczotii* Dej
- *erythropus* Dej
- *patruelis* Dej

Amara Bon.
- *latior* Kirby
- *angustata* Say
- *pallipes* Kirby
- *impuncticollis* Say
- *cupreolata* Putz
- *interstitialis* Dej

Badister Clairv
- *notatus* Hald
- *bipustulatus* Fab.

Patrobus Dej.
longicornis Say.
Calathus Bon.
gregarius Say.
Platynus Bon.
sinuatus Dej.
extensicollis Say.
pusillus Lec.
moerens Dej.
atratus Lec.
melanarius Dej.
affinis Kirby.
metallescens Lec.
cupripennis Say.
nutans Say.
placidus Say.
bogemanni Gyll.
quadripunctatus DeG.
rubripes Zimm.
sordens Kirby .
ruficornis Lec.
retractus Lec.
lutulentus Lec.
Lebia Lat.
tricolor Say.
viridis Say.
pumila Dej.
Blechrus Mots.
nigrinus Mann.
Metabletus Sch.—Goeb.
americanus Dej.
Axinopalpus Lec.
biplagiatus Dej.
Callida Dej.
punctata Lec.
Cymindis Lat.
cribrata Lec.
Chlaenius Bon.
sericeus Forst.
pennsylvanicus Say.
Brachylobus Chd.
lithophilus Say.
Agonoderus Dej.
pallipes Fab.
pauperculus Dej.
Harpalus Lat.
erraticus Say.
viridiaeneus Beauv.
Harpalus Lat.
pennsylvanicus DeG.
pleuriticus Kirby.
sp., near pleuriticus
herbivagus Say.
fuliginosus Dej.
conjunctus Say.
Acupalpus Lat.
hydropicus Lec.
Bradycellus Er.
rupestris Say .
Anisodactylus Dej.
harrisii Lec.
nigrita Dej.
baltimorensis Say.
lugubris Dej.

NOTES

Cicindela 6-guttata. Common on fences, stone walls, along the roads and on sidewalks in town.

Cicindela purpurea. I once found this species abundant the last of April on a slight slope, facing south, in an open pasture near Potsdam.

Cicindela vulgaris. This species seems rather rare at Potsdam. I have taken but one or two specimens there; one taken in the Adirondacks.

Cicindela repanda. Not at all common at Potsdam.

Cicindela 12-guttata. Fairly common; abundant in the Adirondacks, principally along the roads.

Elaphrus ruscarius. Have taken but two specimens of this species: these were on wet ground at the edge of a brook.

Blethisa julii. Have taken but a single specimen of this species. This was, I think, taken under stones on the river bank, not far from the water.

Notiophilus semistriatus. Have taken two or three in pastures.

Bembidium graciliforme. One taken in the Adirondacks.

Amara angustata. Abundant at Potsdam. Taken principally by sweeping grass on fairly low ground. They are often high up on the grass-stalks, near the heads.

Calathus gregarius. Quite common at Potsdam: usually found under boards, rails, stones, etc., in the fields. Generally several will be found together.

Platynus pusillus. One taken in the Adirondacks.

Platynus retractus. One taken in the Adirondacks.

Lebia pumila. One taken in the Adirondacks.

Metabletus americanus. Very common: have taken dozens about stones in open pastures.

Cymindis cribrata. Rather rare: have taken five or six at the base of mullein stalks, under the leaves, in a dry pasture

* * *

Collecting in Baltimore Co., Md

By EDW. A. PLITT, Baltimore, Md.

Although we should think that in and around so large a city as Baltimore there would be very few butterflies and moths, yet I have found that nearly all of the various species of the Middle Atlantic States are here represented.

One of the best places for an ardent collector is the well-known Clifton Park, situated near the outskirts of the city. The presence of innumerable southern flowers and shrubs, cultivated in the nurseries of the park, is a great attraction for thousands of insects, butterflies and moths.

During the months of June and August I am at this place from early morning till late at night collecting butterflies and moths. Between nine o'clock in the morning and four in the afternoon is about the best time for this purpose. During these hours I have collected beautiful specimens of *Argynnis idalia* and *aphrodite, Limenitis ursula, Papilio philenor, turnus, glaucus* and *troilus*, some of which have an expanse of from four to five inches. One of the finest specimens taken last season was a *Papilio glaucus,* which had two bright yellow spots on the upper wings and whose lower wings were almost completely yellow like those of *turnus.* Besides these there are great numbers of others, such as *Vanessa antiopa, atalanta, huntera, cardui,* etc.

In the evening just as it is getting dark, this same place becomes a regular paradise for a collector of moths, etc. Going in amongst the beds of Phlox, I have caught great numbers of the different species of the Sphinx family; but these always fly so very fast that it is extremely difficult to get at them with the net, for the slightest noise made by the breaking of a twig or the rustling of a leaf will frighten them, and off they go.

As soon as night has settled, the larger moths, *i. e. Citheronia regalis, imperialis, polyphemus, cecropia, cynthia, promethea, Actias luna* and great numbers of *Catocalas,* among which are the red, yellow, white and black kinds, begin to fly around the lamps and electric lights of the park, which attract them in so great numbers that the collector is kept busy with his net and jar, until he returns home, weary with a good day's work and the proud possessor of a fine collection for his cabinet.

Besides this park there is another fine place, called Druid Hill Park. Here I have taken great numbers of *Papilio ajax, Apatura clyton, Grapta comma, Terias nicippe, Anisota senatoria* and *virginiensis,* also many other kinds peculiar to swampy and wooded regions.

The only difficulty in collecting at this place is the presence of large numbers of copper-head snakes, which make this region very dangerous for a collector, for he has to be very careful where he places his foot. Even such a danger as this will not be thought of when one is chasing a fine specimen.

I clearly remember on one occasion when I surely thought my last hour had come. I had been collecting for a good while, when a beautiful *ursula* crossed my path, flew over the tops of some trees, across a small brook and over a field. It did not take me long to get up to the place where it had alighted, but instead of letting itself be caught, it flew up and then across a wide stream. My mind was quickly made up as to what to do. I waded through the stream, scrambled up on the other bank and ran toward the bush on which it had alighted. I quickly threw the net over my prize, and, stepping closer, wanted to transfer it into my jar. Just as my foot touched the ground I heard a fearful hissing, and before I could look for the cause of it a large snake jumped out at me from under the bush. Thanks to my net, it did not strike me, but got entangled in the bag. Now instead of getting one specimen, I had two, one of which I could not kill very well with my jar.

The first thing I did was to get a good strong stick, with which I managed to kill the serpent, which proved to be about five and a half feet long, of a dark brown color, but fortunately for me, not a copperhead.

Thus we see that although collecting here is a little dangerous, Baltimore County ranks high in the production of butterflies and moths, which will always be the delight of our collectors and admirers of Nature.

MR. HENRY L. VIERECK has accepted a position as entomologist with Parke, Davis & Co., Detroit, Mich.

THE collection of butterflies and moths made by the late Dr. Herman Strecker, of Reading, Berks County, Pennsylvania, has been sold to the Field Museum, Chicago, Illinois.

BUTTERFLY BOOTH. At the State Fair Pavilion the Most Interesting Section in Big Hall.—The collection of butterflies being displayed this year at the pavilion by Fred Burns, of Reno, Nev., attracted hundreds of people daily, and well it might, as they have been sent Mr. Burns from all over the world.—*Newspaper.*

4

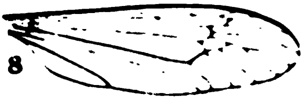
6

5

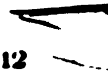
7

9

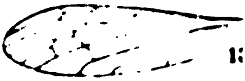
10



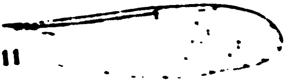
8



12



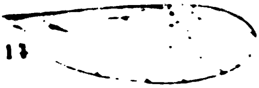
13



11

15

16



14

17

Variations in the Wing Venation in some Tipulidae.

R. W. DOANE, Stanford University.

(Plate XVII.)

In all systematic work on the Diptera the wing venation is a character that is used perhaps more than any other in separating the larger groups and in many instances is of real generic and often of specific value, so close does the venation hold to a type. In the families with the more generalized type of venation, however, there is more or less of a tendency to variation especially in the relative length and position of some of the veins in the outer portion of the wing.

In the Tipulidae the presence or absence of the second posterior cell and the length of the petiole by which it is joined to the discal call are characters that are largely used. The cell is always present in normal specimens of *Tipula*. I have before me a specimen of *T. simplex* Doane, in which this cell is entirely wanting in both wings, the wings otherwise being perfectly normal (See Fig. 1; in all the figures only the outline of the wing and the venation is shown, as the marking would in some instances obscure the point that we wish to show). The wings of the male of this species are subject to considerable variation in size and shape and intensity of the markings, but the venation is, as a rule, quite constant. (Compare Figs. 2 and 3.)

One of the principal characters that is often used for separating the genus *Tipula* from *Pachyrhina* is the presence or absence or short length of the petiole of the second posterior cell. In *Pachyrhina* this cell is sessile or with a very short petiole, while in *Tipula* the petiole is usually longer. There is considerable variation in this respect in both genera, however, even within the species, and indeed sometimes in the two wings of the same individual as shown in figures 4 and 5, which are the right and left wings of a specimen of *Pachyrhina ferruginea*, more or less variation is often shown. In the right wing, Fig. 4, the second posterior cell has a very distinct and, for a *Pachyrhina*, rather long petiole. In the left wing, Fig. 5, this cell is sessile. Fig. 6 is from another specimen of the same genus showing this cell broadly sessile.

Figs. 7, 8 and 9 show the variations that occur in the length of the petiole of this cell and also variations in the size and shape of the discal cell in *Tipula aequalis* Doane.

The position of the posterior cross-vein is a specific character that is often used and is quite constant in some species. In other closely related species it may be of no value on account of the variations that occur. Fig. 10 shows the wing of *Dicranomyia badia* O. S. with the posterior cross-vein in its normal, that is, most usual, position, but it is often found much anterior to this as shown in Fig. 11. Figs. 12 and 13 show the variations that may occur in the position of this vein in the right and left wings of the same individual. (*Limnobia triocellata* O. S.)

In certain groups we often find extra or "supernumerary cross-veins that may or may not occur in all the individuals of the species or they may be present in only one or in both of the wings. Whenever they do occur their position is quite constant for the species and sometimes for the genera. Fig. 14 shows such a vein occurring in the sub-marginal cell of both wings of a specimen of *Limnobia triocellata* O. S.

A short stump of a vein often occurs near the origin of the praefurca in some species. In Fig. 11 (*Dicranomyia badia* O. S.) and Fig. 15 (*D. Stigmata* Doane) two such veins are shown.

Fig. 15 also shows a remarkable case of a distinct piece of a vein occurring in a part of the wing where a vein never occurs normally

All or a part of a vein may sometimes be wanting in specimens where it normally occurs. Fig. 10 shows two such veins in the region of the discal cell. Only rarely do we see interpolated cells as shown in Fig. 16 (*Limnobia sciophila* O. S.) and Fig. 17 (*Tipula simplex* Doane). Both of these aberrations occur in the right wing only of these two specimens.

These few examples selected from many that might have been used show two things: first, the ever present tendency to vary particularly among the more generalized types of wing venation; second, the danger of drawing wrong conclusions in regard to the systematic position of a specimen of a species when represented by only one or two individuals. These variations are doubtless of no value in the history of the species, as they probably disappear in the next generation, although I know of no experiments to test this.

The figures are redrawn from photographs. The markings on the wings, if any, are not indicated in the drawings.

EXPLANATION OF PLATE XVII.

1. *Tipula simplex* Doane, 2nd posterior cell wanting in both wings.
2 and 3. *Tipula simplex*—to show difference in size and shape within the species.
4 and 5. *Pachyrhina ferruginea* Fabr, right and left wing from same specimen. Note presence of petiole of 2nd posterior cell in 4 and absence in 5.
6. *Pachyrhina ferruginea* Fabr. Note 2nd post. cell broadly sessile.
7, 8, 9. *Tipula aequalis* Doane, to show variation in shape of discal cell and length of petiole of 2nd post. cell.
10. *Dicranomyia badia* O. S. Note abbreviated vein at end of discal cell and abbreviated branch of the 4th vein; posterior cross vein in normal position.
11. *Dicranomyia badia* O. S. Note posterior cross vein before the discal cell; also spur on praefurca.
12 and 13. *Limnobia triocellata* O. S. Note difference in the position of the posterior cross-vein in the right and left wing of the same specimen.
14. *Limnobia triocellata* O. S. Note supernumerary cross veins in submarginal cell.
15. *Dicranomyia stigmata* Doane. Note short piece of vein in spurious cell.
16. *Limnobia sciophila* O. S. Note two interpolated cells.
17. *Tipula simplex* Doane. Note interpolated cell.

* * *

MR. DAVID T. FULLAWAY, of California, has received an appointment to the Hawaiian Experiment Station at Honolulu.

PRINCE FERDINAND, now King of Bulgaria, is an entomologist of note and a member of some of the European societies. An article on the King appeared in a recent number of *Rovartani Lapok*. We believe a good entomologist should make a good ruler.

Notes on the Early Stages of some Pamphila.

By Philip Laurent.

Several years ago the writer on observing a species of *Pamphila* depositing her eggs on a blade of grass made up his mind to try and see if he could not do something towards unraveling the life history of some of these interesting butterflies, a genus of butterflies of which there is comparatively little known of their early stages—and yet so easy to find out if one will but go to the trouble. The reason that the preparatory stages of many of the species mentioned in this article are not complete, is not because the species are hard to raise; but to the fact that business or something else always called me away about the time I should have been at home attending to my larvae. It is true that, on several occasions I took my larvae along with me, but as a rule I had very little success when I did this; this is particularly true of *Pamphila aaroni*, the larvae of which I carried from Philadelphia to Johnson City, Tenn., only to loose them on my arrival at the latter place by the lid of the jelly jar becoming loose. The eggs of *Pamphila* are easily secured; the larvae are easy to raise, and the food plant (grass in nearly every, if not in every case) can be found by every one. With care in keeping the cages (which should consist of test tubes or jelly glasses during the early stages) free from moisture, there is no reason why one should not be successful in rearing *Pamphila*. To secure the eggs plant a small piece of grass sod in a flower pot and cover the same with netting—the high, wire fly-traps answer admirably for this purpose. In the cage place your female "skipper," and the chances are that in forty-eight hours or less time eggs will be found on the blades of grass. As a rule, the eggs are deposited during the night. In securing the butterflies I [illegible] the same method as if I was collecting specimens for my cabinet; with the exception that, when the butterfly has succumbed to the effects of the cyanide, I immediately remove the insect from the jar, placing each one in a separate pill box. On arriving home you will find that your butterflies have rec ered from the effects of the cyanide and are as lively as crickets. In nine cases out of ten you will find that the females will deposit fertile eggs. The eggs should be placed in cardboard boxes until they hatch; by no means place them in glass or metal boxes, as they are apt to mildew. The larvae seem to feed more readily on the coarser species of grasses; this is particularly true after they have passed the second moult. I have left out several interesting facts concerning the breeding of *Pamphila,* as I do not wish to consume too much of the valuable space of the NEWS.

1. **Pamphila massasoit.**

Two females of this species captured on the fifth of July, deposited eggs on the seventh of July. The eggs are nearly round; the base is slightly flattened; color of egg, opake white. The eggs hatched on July eighteenth. When first hatched the larvae are of a dirty yellow color, and rather slender; body sparsely covered with long yellow hairs. Head nearly smooth, and of a light chestnut color. First moult occurred on July twenty-eight. The larvae are now of an olive green color, otherwise same as when first hatched. This species has been reported as being double brooded in New England, but in the vicinity of Philadelphia I think we have but one brood. I have never seen the butterfly on the wing before the fifteenth of June, or later than the fifteenth of July. It is very common in southern New Jersey about the fourth of July, and at that time the butterfly can be found on the flowers of the button-ball bush, as well as on the flowers of the cranberry and the flag.

2. **Pamphila zabulon.**

A female of this species was confined in a cage on May the twenty-fourth, and the next day several eggs were laid. The egg is of a pale green color and somewhat broader than high; the egg is covered with numerous fine depressions, and the apex is slightly flattened. The eggs hatched on the eighth of June. When first hatched the larvae are of an opake white color, but this changes to a dark green twenty-four hours after the larvae start to feed. Head and collar dark brown, the head being roughly corrugated. The first moult occurred on the sixteenth of June, the larvae now being of a yellowish green color, otherwise the same as before. June the twenty-fourth the second moult occurred. Larvae are now of a grass green color, and are sparsely covered with numerous dark colored stiff hairs and also with numerous white spots, a greenish dorsal line is also in evidence, along with a sub-dorsal line of the same color. The head is light, or chestnut brown, with the suture very distinct. July third, the third moult occurred. The larvae are now of a darker green, and the anal shield shows a pinkish tinge, otherwise same as before. On July the thirteenth the larvae moulted for the fourth time. I noticed no difference in the larvae since the third moult. July the twenty-fourth the larvæ went into the chrysalis state, first forming a resting place in which to undergo this change by drawing two or more blades of grass together. On August the fourth a female butterfly emerged, the next day two males made their appearance. This species is double-brooded in the neighborhood of Philadelphia.

3. Pamphila hobomok.

A description of the egg and larval stages of this species would be almost identical with that of *P. zabulon*, so I omit the description. However, some of my larvae went into the chrysalis state after the fourth moult, while others passed a fifth moult. The larvae when full grown are somewhat larger than those of *P. zabulon*, and somewhat darker. Have had this species to hibernate over winter in the egg, larval and chrysalis states. The species is double brooded in the vicinity of Philadelphia.

4. Pamphila metea.

On the fifteenth of May, at Clementon, N. J., I secured several females of this species. The eggs were laid on the seventeenth of May. The egg is of an opake color, and covered with very fine reticulations; the egg is nearly hemispherical in shape, and has the apex slightly flattened. The eggs hatched on June the ninth, or twenty-two days after they had been laid. When first hatched the larvae are of an opake white, but twenty-four hours after starting to feed they were of a dark green color, with the body sparsely covered with long, light grayish hairs. The head and collar are nearly black, and shiny. Feet and prolegs of an opake white color. The first moult occurred on June the nineteenth. Shortly after moulting the larvae assumed a clear green color, otherwise I see no change. The second moult occurred on June twenty-eighth. The body is now of an oil green color, otherwise can notice no change since last moult. Third moult occurred July the ninth, but I notice no change in the appearance of the larvae. Fourth moult occurred July the eighteenth. The larvae are now of a very dark green color, almost approaching a brown. Fifth moult occurred on July the thirty-first. The larvae are now of a dark brown color, and covered with numerous brown spots of a darker color than the body; a distinct narrow dorsal line of a greenish color is also noticed. August eleventh. The larvae are now about full grown, and are about one and an eighth inches in length when body is extended. August twelfth. First of the larvae changed to chrysalis to-day. The chrysalis is about three-quarters of an inch in length, at first of a light green color which two days afterwards gives way to a drab color. I kept the chrysalids under my eye until the first of October, when no imagoes having emerged, I placed the cage containing the chrysalids in a cool, dry part of the cellar. I removed the cage from the cellar about the first of May of the following year. Three specimens emerged between the seventh and the eleventh of May. I believe the species is single brooded in southern New Jersey.

5. **Pamphila leonardus.**

Secured several females of this species at Atco, N. J., on September the third, fertile eggs were laid on the fifth of September. The egg is half again as broad as high; of an opake white color, and very finely punctuated. Eggs hatched on the sixteenth of September. The larva when first hatched is of an opake white color, and sparsely covered with long hairs.

The head and collar are brown, and but slightly reticulated. The first moult occurred on October fourth; twenty-four hours after moulting the larvae were of an oil green color, and thickly covered with dark brown spots; an almost indistinct dorsal line is also present. My larvae now refused to eat, although they remained alive until November first. The butterfly is single brooded in southern New Jersey.

6. Pamphila otho.

From a female confined on the fourth of July I secured one egg on the sixth of July. The egg is yellowish white apex slightly flattened, and is somewhat broader than high. On July the fifteenth the egg hatched. The larva when first hatched is of an opake white color, this color giving way to that of an oil green after the larvae had been feeding for twenty-four hours; the larva is also covered with dark brown spots, and short, dark colored, spine-like hairs. The head is very finely reticulated, and of a blackish color. The first moult occurred on July the twenty-fourth, but I notice no difference in the appearance of the larva. On August the third the larva moulted for the second time, but I notice no difference except in the size. The third moult occurred on August the sixteenth. The larva is now about a half inch in length and of a greenish brown color; a distinct dorsal line is visible. On October fourth my only larva died.

7. Pamphila mystic.

On July the seventh I secured a few eggs of this butterfly from Mr. H. E. Wilford, of Batavia, New York. The egg is almost hemispherical in shape, and is covered with fine reticulations; the color of the egg is pale green. Larvae emerged on the ninth of July, two days after I received them from Mr. W. Shortly after emerging the larvae assume a light yellow color. Head and collar are black and shiny, and covered with very fine reticulations. The first moult occurred on July the eighteenth. Twenty four hours after moulting the larvae were light green in color, and covered with numerous white spots. Second moult occurred on July the twenty-sixth. The head now covered with numerous spine like hairs; a dorsal line of a greenish color is also in evidence. Third moult occurred on August the seventh. The larvae are now about a half inch in length, with the body of a dark brown color; otherwise, same as before.

8. Pamphila cernes.

Two females placed in the cage on May twenty-fourth deposited some thirty eggs on the twenty-fifth. The egg is almost round, of an opake white color, and finely reticulated. The first larvae appeared on the eighth of June. The larvae when first hatched are of the same color as the egg, but twenty-four hours after feeding they assume a dark green color. The head and collar are almost black, and but slightly punctuated. First moult occurred on June seventeenth. Shortly after moulting the larvae were of a yellowish green, and covered with numerous brown spots. A dorsal line is plainly visible. Second moult occurred on June the twenty-eighth, but I notice no change in the larvae since first moult. The third moult occurred July the sixth. With the exception that the larvae are larger, and the dorsal line more distinct, I notice no change since last moult. July sixteenth the fourth moult occurred, but I notice no change in the appearance of the larvae since the third moult. On July the twentieth a number of the larvae entered the chrysalis state; for the first two days the chrysalis is of a greenish color, after which it changes to a drab color. The first imago made its appearance July twenty-eighth. Between July the twenty-eighth and August fifth some twenty imagoes made their appearance. The species is double-brooded in the vicinity of Philadelphia.

9. Pamphila manataaqua.

A female of this species was placed in the cage on June fourteenth, and during the fifteenth she deposited a number of eggs. The egg is somewhat broader than high, and is of a pea green color; distinctly marked with numerous punctuations, and the apex is slightly flattened. I was successful in raising this species, but aside from this description of the egg I cannot give the other early stages, as I have lost my notes. A number of the butterflies emerged from the chrysalis state from August the twenty-eighth to September the first. The species is double-brooded in the vicinity of Philadelphia.

10. **Pamphila verna.**

From a female caged on June twenty-ninth, I secured a number of eggs on July first. The egg is of a light green color slightly wider than high; finely punctuated, and apex flattened. The larvae hatched on July the thirteenth; when first hatched they are of an opake white, but twenty-four hours after feeding the larvae were of an oil green color; the body is marked with numerous brown spots. Head and collar almost black, with slight punctuations. First moult occurred on July the twenty-second. The larvae are now of a lighter green, with numerous black spine-like hairs scattered over the body; a faint greenish dorsal line is present. Second moult occurred on August second; twenty-four hours after moulting the larvae showed a heavy, greenish dorsal line, as well as a sub-dorsal line on each side of the body; the body is also covered with numerous white spots. August eleventh, the larvae moulted for the third time. Twenty-four hours after moulting the larvae assumed a lighter shade of green, otherwise I see no difference since last moult. Fourth moult occurred on August twenty-second. I notice no change since last moult. A fifth moult occurred on September fourth. The only change noticed since last moult is in the color of the body, which is now of a yellowish green. After carrying this insect successfully through its five moults, I lost them by a windstorm which blew my cage over, thus allowing the larvae to escape.

11 **Pamphila panoquin.**

Secured three female specimens of this butterfly at Anglesea New Jersey, on June eighteenth; from these females I secured some twenty fertile eggs on the nineteenth. The egg is of a pea green color, and is about as high as broad, with very fine reticulations. June twenty-seventh the eggs hatched. When first hatched the larvae are of an opake white color, and rather slender. The head is of a light brown color, and is much wider than any part of the body. Twenty-four hours after starting to eat the larvae assumed a greenish, yellow color. July the seventh my last larva died. I gave the larvae grass from the salt marshes as well as grass from my garden in Mt. Airy, and the larvae ate both, so the food plant had nothing to do with their death. The species is double-brooded, the first brood being at its height about the fifteenth of June, while the second brood is at its height about the fifteenth of August. It is strictly a maritime species, although, a specimen was captured in Fairmount Park, Philadelphia, by Mr. Haimbach some years ago.

12. **Pamphila bimacula.**

Eggs of this species were sent to me by Mr. H. E. Wilford, of Batavia, New York. The egg is light green in color, and finely reticulated; somewhat broader than high, with apex slightly flattened. The eggs did not hatch.

13. **Pamphila pontiac.**

Two females of this species were secured on the fifth of July, the eggs being deposited on July seventh. The egg is entirely different from any other *Pamphila* egg that I have ever seen, being rather flat, and half again as broad as high, and of a light lemon color; finely reticulated, and apex slightly flattened. The eggs hatched on July the nineteenth. The larvae when first hatched are of a light lemon color. Head dark brown and finely reticulated. The first moult occurred on July the twenty-eighth. Shortly after moulting the larvae assumed a very light green color. Numerous dark brown, spine-like hairs are scattered over the body. The head is now of a light brown. The species appears to be single brooded in Eastern Pennsylvania and southern New Jersey. I have never observed the butterfly before the end of June or later than the middle of July.

14. **Pamphila dion.**

Eggs of this species were sent to me by Mr. H. E. Wilford, of Batavia, New York. I received the eggs on the eighth of

July. The egg is of a light green color, and finely reticulated and is somewhat broader than high; the apex is slightly flattened. On July the sixteenth the larvae emerged from the egg. The body of the larva twenty-four hours after hatching is of a yellowish green, and is sparsely covered with yellowish hairs. Head and collar shiny black. Larvae moulted for the first time on July twenty-sixth. A few hours after moulting the body of the larva became a light green.

15. **Pamphila aaronii.**

Brought home from Anglesea, New Jersey, on June the twelfth, three females of this butterfly. The eggs were laid on the thirteenth of June. The egg is slightly wider than high and of an opake white color, finely reticulated, and the apex is slightly flattened. Eggs hatched on June twenty-second. The larvae when first hatched have the body the same color as the eggs, but twenty-four hours after starting to eat the larvae were of a greenish drab color, otherwise I notice no change in the appearance of the larvae. First moult occurred on July the first; twenty-four hours after moulting the larvae assumed a beautiful, light green color; all the legs are the same color. This species is strictly a maritime one, being very common on the salt meadows of southern New Jersey. The species is double brooded, the first brood being at its height about the fifteenth of June, and the second brood about the fifteenth of August. It is often found in company with *P. pa*[illegible] both species having the same habit, and both appearing on the wing about the same time. The August brood of both species will outnumber the June brood by ten to one.

16. **Pamphila fusca.**

A female secured on August the seventeenth deposited eggs the same day. The egg is shiny, pearl white, and not [illegible] white as is so often the case with the eggs of *Pamphila*. The surface of the egg is very finely reticulated, and the apex of the egg is decidedly flattened. Eggs hatched on August the twenty-seventh. The larvae when first hatched are of an opake white color. Head and collar very light brown. The was an exceptional case for me, as I could not induce the larvae to feed. The species is double-brooded in eastern Pennsylvania and southern New Jersey.

17. **Pamphila viator.**

Secured a number of eggs of this species from Mr. H. E. Wilford, of Batavia, New York. The eggs were laid about July the seventh. The egg is grayish in color; finely reticulated, and somewhat wider than high, with apex but slightly flattened. The eggs hatched on July the sixteenth. The larva of this *Pamphila* is entirely different from the larvae of any other *Pamphila* that I have ever seen. Twenty-four hours after hatching the larvae were of a grayish color, and covered with numerous dark-colored, spine-like hairs. The head and collar are light yellow and covered with numerous dark brown spots. First moult occurred on the twenty-fifth of July. Twenty-four hours after moulting the larvae were of a brown color, otherwise the larvae are the same as before.

Four new Hymenoptera.

By S. A. Rohwer, Boulder, Colo.

Belomicrus larimerensis n. sp.

♀. Length 5 mm. Anterior margin of clypeus produced in middle to a broad, rounded process, at the side of which is a small tooth; clypeus shining, without punctures; head finely granular; behind the antennae is a shallow, smooth depression; on the vertex behind the summit of each eye is an angular protuberance; pronotum rounded, not carinated or dentate; dorsulum sculptured like the head, scutellum somewhat more coarsely so; mesopleura sculptured about as the scutellum, below tegulæ there is a deep vertical furrow; squamæ linear, attached to the postscutellum for their entire length, slightly rounded on the outer margin, perhaps a little broader anteriorly; spine very short; posterior face of metathorax bounded on the sides by distinct carinæ which are abruptly truncate above, irregularly obliquely striated, below spine a vertical carina; marginal cell pointed at apex, widest where the first tr. cu. is received; tran. med. a little anterior to basal; abdomen closely, finely punctured; pygidium broad, rounded at apex, punctured with large separate punctures, color black; two spots on pronotum, tubercles, tip of femora, tibiæ beneath creamy-white; spot on scape beneath at apex, flagellum beneath somewhat, and tarsi testaceous; tegulæ, narrow apical margin of abdominal segments, yellowish testaceous; pygidium red; wing dusky hyaline, nervures dark brown. face, clypeus, side of thorax with silvery pubescence.

Habitat.—Larimer Co., Colo., between 8000 and 9000 feet. July 18, (C. P. Gillette). Co-types in collection of Colo. Agricultural College and in author's collection.

This may be the female of *B. forbesii* Rob. but differs as follows from his description of that species: no depression on posterior face beneath spine, sides of abdomen are not parallel. the wings are strongly dusky, nervures brown.

Crabro (Paranothyreus Koll.) **gillettei** n. sp.

♀. Length about 7 mm. Clypeus broadly truncate, very finely punctured. some large punctures near margin, carina very low and broad. mandibles with a small subapical tooth, at apex obtusely truncate, width of eyes at the clypeus a little more than the width of the clypeus; facial basin smooth, shining, not strongly margined above; between the ocelli and the facial basin the head is striated with irregular striæ; outer orbits and head back of ocelli shining, with sparse, fine punctures, ocelli in a low triangle, the distance between the lateral ones and the nearest eye margin about the same; lateral ocelli back of a line drawn between the superior orbits; furrow from lower ocellus distinct, strong, extending to base of antennæ; pronotum not carinated or dentate, anterior angles sharp, but without teeth; most of dorsulum and scutellum shining, sparsely punctured with rather small punctures; anterior margin of dorsulum with short longitudinal striæ, middle of dorsulum near anterior margin with a distinct carina; mesopleura shining, punctures like dorsulum, below tegulæ there is a distinct pit, enclosure and [illegible] of metathorax not strongly defined, enclosure with a few longitudinal striæ; middle furrow shallow, not extending on posterior face, slightly broader at apex; posterior face with a triangular fovea, apex beneath finely reticulate; metapleura finely, transversely striate, longest spur of hind tibiæ not as long as the first joint of hind tarsi, abdomen impunctate, pygidium broad, flat, sparsely punctured with large punctures. Black, ocelli (dry) reddish, two spots on pronotum, tubercles, spot on scutellum, line on postscutellum, four anterior tibiæ, except [illegible] posterior tibiæ at base, spot on each side of first three abdominal segments (the two apical segments have faint indications of spots) yellow; tarsi testaceous; wings at base yellowish at apex hyaline, nervures and stigma testaceous, the usual pubescence undoubtedly occurs, but the specimen is somewhat worn and it is wanting

Habitat.—Larimer Co., Colo., between 8000 and 9000 feet. July 18, (C. P. Gillette). Type in the collection of Colorado Agricultural College.

This belongs to Fox's group *hilaris* Sm. The black clypeus, mandibles and venter are good superficial characters to separate this species from its allies. The sculpture is much finer than in any allies except *snowii* from which it differs in the wider space between the eyes at the clypeus and other characters.

Crabro (**Xylocrabro** Ashm.?) **besseyae** n. sp.

♀ Anterior margin of the clypeus rounded out, carina distinct; mandibles at apex tridentate, at base within with two large teeth; width of the eyes at the clypeus a little greater than the width of the clypeus; first and second flagellar joints equal; head closely punctured with rather large punctures, more sparsely so on vertex and posterior orbits; ocelli in an obtuse triangle; distance between the lateral ocelli and nearest eye margin about the same; furrow from anterior ocellus rather indistinct; pronotum rather feebly carinated, anterior angle with a small tooth; dorsulum punctured with rather large, strong punctures; scutellum sparsely punctured; mesopleura anteriorly sharply truncated, transversely striated, with some large punctures among the striæ; enclosure and sides of metathorax not sharply defined; enclosure and posterior face rather coarsely, irregularly, closely punctured; postscutellum more finely so; furrow of metathorax extending to below middle of posterior face; metapleura very finely, transversely striate; anterior femora at base beneath with a small tooth; first rec. rather near apex of first cubital cell; abdomen, both dorsal and ventral surfaces, punctured with rather small, distinct, well-separated punctures; pygidium about twice as long as width at base; apical half strongly contracted and narrowed, basal half broad, punctured with large punctures; scape at apex, spot on mandibles, two spots on pronotum, tubercles, anterior femora beneath, four posterior femora beneath for basal half, spots on dorsal abdominal segments 2-5 *bright yellow;* clypeus, cheek and inner orbits with dense silvery pubescence; thorax with some white hairs; wings strongly dusky, iridescent; venation black.

Habitat—Boulder, Colo., May 26, 1908, at flowers of *Besseya plantaginea* (S. A. Rohwer).

This species is nearest to *stirpicolus* Pack., but differs as follows: metathorax above and behind not coarsely striated, etc. The shape of the pygidium should distinguish this species at once.

Ichneutidea secunda n. sp.

♀. Length 4½ mm; length of anterior wing 4 mm. Head shining, impunctate; ocelli in a low triangle; a furrow from lower ocellus to occiput; antennal foveæ quite distinct, wider above the antennæ; antennæ 25-jointed, third joint but little longer than fourth, the last five joints but little longer than wide; sides of the superclypeal area depressed; clypeus round on anterior margin; mesonotum shining, impunctate, except anterior lobe, which finely punctured; scutellum with well-scattered, small punctures; mesopleura shining, impunctate; metathorax smooth, shining, without an areola; posterior femora rather robust; posterior tibiæ tapering from base to apex; first joint of hind tarsi a little longer than 2. .3; tarsal claws simple; stigma angular beneath; first abscissa of radius a little longer than second, but not as long as the oblique transverse cubitus; second transverse cubitus about equal to the second abscissa of radius; second cubital cell pointed at base beneath; basal nervure bent; transverse median more than half its length beyond basal nervure; abdomen impunctate; lateral carinæ of first dorsal segment more or less developed. Color, reddish-yellow; antennæ, eyes, black spot enclosing ocelli, middle lobe of mesonotum, scutellum, metathorax, mesopleura and mesopectus, spot on apical dorsal segments of abdomen, sheath, *black;* apex of hind tibiæ and their tarsi infuscated; wings hyaline, iridescent, apical third a little darker, nervures and stigma pale brown; dorsulum of abdomen and legs with short reddish-yellow pubescence.

Habitat.—Geneva, Nebraska. Type in the collection of the University of Nebraska, paratype in author's collection.

This species is quite distinct from *I. abdominalis* Cress. the only other species of this genus, being known at once by the different color—*abdominalis* has the head and thorax black.

One Day's Collecting, with a Description of a new Noctuid.

By Alex. Kwiat, Chicago, Ill.

On Decoration Day, May 30, 1908, the writer, with Messrs Beer and Kidlica, went on a collecting trip to Hessville, Ind., where we were joined by Will Hartman, Jr., who resides there, making a party of four, all Lepidopterists.

Hessville, Indiana, is just four miles east of the Illinois line and about four or five miles south of Lake Michigan. It is not strictly in the sand dune region, although there are occasional blow holes and shifting ridges. Generally speaking it may be described as a succession of sloughs and sandy ridges, the latter usually covered with stunted oak, hop elm, cottonwood, the small-leaved poplar, some willow, birch, sassafras button bush, hazel, blueberry and other trees and shrubs. There is a great variety of low woody perennials on the sides of the ridges.

Most of our collecting is done on the Hartman Farm, which is largely wooded. Drainage and a little care has resulted in a larger timber growth and grassy sloughs. The woods are overgrown with ferns. The open ridges are covered with blackberries and lupine, phlox, goldenrod, milkweed of various kinds and other flowering plants abound here and on the edges of the sloughs. There is also a lot of flowering spurge (*Euphorbia corollata*).

The ride from Chicago, about 23 miles, occupies an hour's time, and after depositing the greater part of our luggage at the Hartman home, we got after the butterflies. It was a windy and more or less cloudy day. In exposed places the butterflies and moths would not rise unless disturbed and would then be difficult to capture, for the wind would carry them away.

One object we had in mind was to locate *Lycaena scudderi* and if possible observe its ovipositing habits. We found the butterflies, a few of them including several females, but they would not lay an egg, even though we entreated them and coaxed them to do so.

A little farther on where the sloughs were somewhat protected by timber along the sides collecting was better. In the woods there was practically nothing to be had and we spent little time there.

Toward the middle of the afternoon we were more or less discouraged, for nothing particular had been taken except a tattered specimen of *Cirrhobolina deducta* by Mr. Beer, and we were trailing back to the house when the writer caught a glimpse of a small moth resting on the common field phlox (*Phlox pilosa*), which was in full bloom. The flower was swaying wildly in the wind and the moth seemed to disappear immediately. A call brought the others running and while they stood ready to bag it with the net if necessary, the specimen was bottled without difficulty.

The moth was such a fine example of protective resemblance that even when the exact spot was pointed out where it rested, Mr. Beer and Mr. Hartman were unable to see it. Immediate search was instituted for more and during the balance of the day we took twenty-three specimens, some of them in coitu. The moth has since been sent to Prof. John B. Smith, who declared it to be a new species and has described it as *Heliolonche indiana*.

It seems paradoxical that a new species and seemingly a common one should be found in such a well-collected territory as this near Chicago. It can perhaps be explained by the habits of the moth, which are decidedly sluggish, specimens usually dropping to the ground when disturbed. This, coupled with its close resemblance to the flowers upon which it rests, may account for it.

Following is a list of the other species taken during the day:

Argynnis myrina
Neonympha eurytris
Chrysophanus hypophlaeas
Lycaena scudderi
Lycaena pseudargiolus
Papilio polyxenes
Papilio troilus
Pamphila hobomok
Nisoniades icelus
Nisoniades juvenalis
Eubaphe brevicornis
Plusia aerea
Erastria malaca
Prothymia semipurpurea
Acontia candefacta
Metathorasa monetifera
Pangrapta decoralis
Euclidia cuspidea
Apaecasia detersata
Apaecasia defluata
Xanthotype crocataria
Loxostege chortalis
Tholeria reversalis
Crambus laqueatellus
Stenoma schlaegeri
Pamphila cernes
Cirrhobolina deducta
and several unidentified Micros.

All perhaps not exceptional, but the new species enlivened an otherwise dull way, which was therefore declared a successful one.

This, however, was not the end of the trip for us, for we came prepared to spend the night in the woods with lights and sugar to attract the night fliers. This, while not a long story, will be reserved for another occasion.

Professor Smith's description of the new species is as follows:

Heliolonche indiana n. sp , Smith.

"Head, thorax and abdomen black, clothed above with long fine whitish hair: the tint on head tending to yellowish and on the thorax to purplish: in well preserved specimens the segments of the abdomen are marked with paler rings and in the males there is a tendency to a yellowish anal tuft. Beneath the hair is finer and more sparse, yellowish. The primaries at first sight appear to be almost uniformly purplish carmine. Closer examination of a large series shows that the narrow even terminal space is decidedly paler with a purplish wash over a luteous base, while the median area is paler and decidedly more purplish. The contrasts are not very marked in any case, and sometimes almost absent. Fringes whitish. Secondaries black, immaculate, fringes white. Beneath; primaries black on disc, costal margin more or less carmine tinged the apex and outer margin tending to luteous, inner margin more or less yellowish: a large more or less obvious deeper black discal spot: secondaries with costal and apical areas carmine, then black to the inner margin, fringes whitish, an indefined large discal blacker spot. Expands .62 - .72 inches or 15.5 - 18 mm.

"*Habitat.*—Hessville, Indiana, May 30th, June 6, 13.

"Ten males and nine females, all in good or fair condition from Mr. Alexander Kwiat, at whose request I have prepared the above description and who will give further details concerning the habits of the species and the circumstances relating to its capture."

On the upper side there is little variation. On the underside there is a considerable range in the proportion of the black and purplish areas. Sometimes the black predominates, leaving only a narrow purplish or carmine costal and apical area: the other extreme is where the wing has a carmine wash over a yellowish base, the black restricted to a large discal spot a subterminal band and a basal shade extending somewhat through the centre of the wing.

In structural details the species agrees in most details with *modicella.* The front is not protuberant and there is a narrow thickened frontal ridge along the inferior border. The anterior tibiae are somewhat shortened, broad and flattened with a very long curved claw-like spine at the inner side of tip and two stout spines above it: at the outer side there is a shorter and smaller curved spine at tip and two others not much smaller above it. The spines of the middle tibiae are long and distinct in the hairy vestiture; those of the posterior tibiae are small, scanty and concealed so that the member seems unarmed to ordinary examination.

NOTE.—To complete the information on this species the writer and Mr. Arthur Herz found on July 4th, what we take to be the larvae of this species feeding on the seed pods of the Phlox. Unfortunately they pupated before a description could be taken.

◆

A Hunt for Saldoida Osborn.

By ANNIE TRUMBULL SLOSSON.

In the winter of 1898-99 I was in Punta Gorda, on the west coast of Florida. One day while out collecting I sat down on a fallen tree to rest. It was a damp, grassy spot and there were many ants running over the ground. While idly watching them I noticed one which seemed different from the others and stooped to pick it up for examination.

To my surprise as my hand approached it the supposed ant, instead of running away, skipped, jumped or leaped like a flea or cricket and disappeared in the grass. I was puzzled and excited. Had I discovered a saltatory ant new to science? I searched carefully but saw no more of the odd creature that day. Returning to the spot a few days later I again saw it and with much difficulty captured it. It was an Hemipter but quite new to me and I thought it immature. A tiny, reddish-brown insect, its disproportionately large eyes and long, conspicuous antennae gave it a queer brownie-like look. I saw no more specimens and soon after left Punta Gorda.

In the following spring as I was sending some Hemiptera to Prof. Uhler I included this curious unique. He was most interested in it, told me it belonged to the Saldidae and possibly represented a new genus. But he did not care to found such a genus on one specimen alone.

The next winter 1899-1900 I spent a few days in Jacksonville, Florida. Wandering one afternoon in the suburbs of the city I stooped to examine a plant growing in a sort of ditch at the side of the road. There was no water in this but the soil was damp and again ants were running over the surface. I watched them not thinking at all of my former experience and the little Saldiid, when suddenly I saw an alien among the others and soon captured it. It was the same big-eyed little imp I had taken at Punta Gorda or seemed so to me. But I searched vainly for other specimens. That summer when sending some Hemiptera to Prof. Herbert Osborn I put into the box my two Saldiids. Prof. Osborn at once decided that they represented an undescribed genus and also two different species. These he described—Can. Entom. Vol. xxxii, p. 181. The genus he named *Saldoida*, the two species, respectively, *slossoni* and *cornuta*. I visited Florida every winter after this and always searched for my agile, mud-loving treasures but in vain. I had, however, discovered in an old box of duplicates, one damaged specimen of *Saldoida,* about whose capture I could remember nothing. It was labelled simply "Florida." At this specimen I often looked to refresh my memory as to the general appearance of the rare insect and with ardent hopes that I might sometime again find similar species.

I was detained in the North during the two winters of 1904-1905 and 1905-06 and thought that I should never again visit Florida. But an attack of grippe last December changed my ideas and I decided to go a little later to the west coast, selecting Belleair on Clearwater Harbor for my headquarters. This is about twenty-five miles west of Tampa and a charming spot. I reached there on January 22d, found few signs of spring and almost no insects.

It was an unusually backward, tardy season, the nights cold and even frosty until late in February. But just before the advent of March the warm weather came very suddenly and animal and vegetable life became abundant.

A few weeks before coming South I had received a letter from Dr. Otto Heidemann telling me that Prof. Reuter of Finland was anxious to examine specimens of *Saldoida* while engaged in study of the family. I dared not risk sending my precious unique across the seas and told Dr. Heidemann so.

But I added that I should soon be in Florida and hoped to find again specimens of the rare little creatures. As I had looked for them already for ten years with no success this hope seemed an uncertain and feeble thing. I cherished it, however, and searched often in the most promising spots for the tiny Saldiid but always vainly.

As often happens in this odd life of ours I found it at a time when I was not hunting for it, not even thinking of it. I had been delighted to discover for the first time a colony of *Atta*, one of the ants which make fungus-gardens. I had read with great interest of their habits and Mr. William T. Davis had told me of watching colonies at Lakehurst. I was much excited over my own recognition of the little gardeners. For several days I spent hours at a time bending over the nest and watching the ants returning from their quest with material for planting or keeping up the fungus-garden. It was while I was trying to keep track of one of those on its circuitous, wandering way that I noticed a strange looking ant on the damp soil. Not thinking of *Saldoida*, interested at the moment in ants and ants only, I wet my finger and lifted the creature to drop into my bottle. As I did so I was conscious that I had crushed it. Now ants do not crush easily and the apparent softness of this one's body surprised me. But I forgot it in a minute as I intercepted the next little agriculturist and robbed him of his small burden. I was much excited for the rest of that day and so did not even look over the contents of my various alcohol and cyanide bottles. But [illegible] awake that night and living over, as one often does, the [illegible] experiences of the day I thought suddenly of the crushed insect. In a flash I remembered *Saldoida* and felt that I had again found one of the genus. I could not wait but struck a light, poured out the contents of the cyanide bottle and with my magnifying glass searched for the specimen. I found it broken and crushed but plainly recognizable as what I had long sought.

Of course I went to the spot next morning, in fact I went nowhere else, spending hours at the damp piece of gr near the Atta's home, with eyes bent steadily upon the surface of the soil where ran scores of ants, watching for sign of a stranger. One single specimen of what I wanted rewarded my search and I went home, cramped, stiff, with aching eyes and muddy gown but a contented mind. I spent many days in a like manner. I soon learned to recognize at a glance the presence of a *Saldoida*. The little creatures have quaint ways of their own not at all ant-like. Their long, conspicuous antennae are waved from side to side as they run swiftly about. They never as far as I know, leap except when startled.

But to recognize this insect is one thing, to capture it is quite another. I lost many, more, I think, than I secured. I tried varying methods, the most successful one being the holding my net near the prey and "shooing" the spry little fellow into it. But this often failed. However I succeeded in securing some half dozen specimens, full grown and perfect, with a few others which were either injured or immature. Among these Prof. Osborn found both the described species, *slossoni* and *cornuta*. Of *slossoni* there were one or two males, not before recognized, the species having been described from a female specimen. The male of *cornuta* is yet to be discovered.

Whether the association of *Saldoida* with ants is accidental I cannot say. I only know that I never found one except in their company. But again I never saw either ant or Saldiid take the slightest notice of one another or seem conscious of each other's presence.

As is almost always the experience of a persistent and close searcher for a particular thing, I was rewarded, not only by success in finding what I was seeking but by discoveries and captures in other lines. Finding that the most likely spots were damp, grassy places especially where the little sun-dew (*Drosera*) was growing, I frequented such localities. The Saldoidas were apparently often in hiding among the low grass and herbage. To start them out I pulled up the plants by the roots. This would often send out a swiftly running little imp, waving his long antennae as he went. But it showed me other things as well. Many small coleoptera were turned up. *Heter-*

occrus pusillus not common in any other locality visited by me was frequently seen, and *Haltica rufa* was so abundant about the roots of grass as to be a nuisance. An unknown *Acalles* was hailed with delight when the first specimen appeared, but it soon grew rather common and proved to be *ventrosus*. Another weevil was abundant, its brassy hue shining in the sun as I stirred it up from the soil, *Tyloderma aereum*. Two or three species of *Tachys*, many small Staphylinids and scores of *Limnichus nitidulus* were taken thus. Several specimens of a carabid new to me with odd deeply pitted elytra proved to be *Selenophorus fossulatus* and I took three specimens of *Hydrochus rugosus* which I had never found before. Sometimes a pupa was found in the soil, or the whitish grub of some scarabid beetle. So my search was not a monotonous one but full of interest and excitement and I shall never regret the long hours I spent so near the earth itself in my hunt for *Saldoida*.

A new Dragonfly (Odonata) belonging to the Cordulinae, and a Revision of the Classification of the Subfamily.

By E. B. Williamson.

(Plate XVIII.)

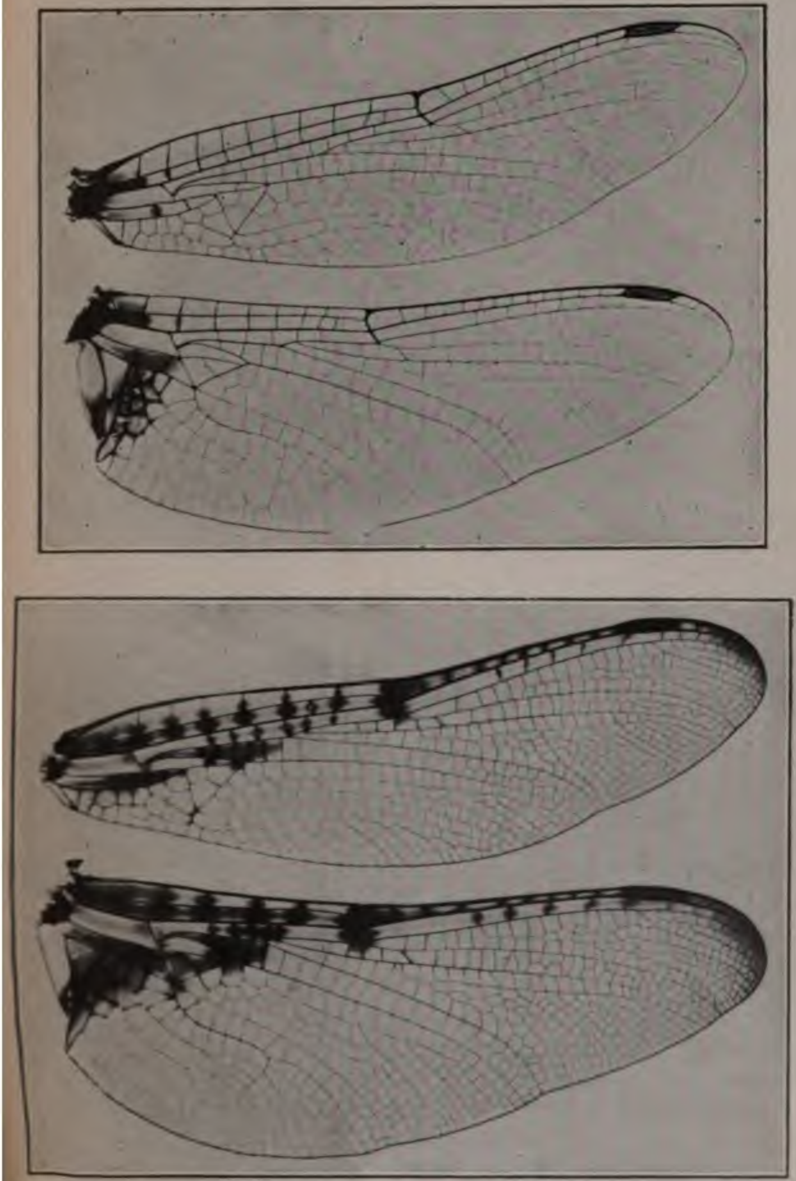
In the past, two groups of Cordulinae have been recognized and defined by the following characters: crossed or free supertriangles, and united (stalked) or distinct (separate) sectors of the arculus. These groups and the sub-groups are familiar to students of Odonata and need not be discussed here, except to call attention to the fact that the classification resulting from the use of these characters has been an altogether artificial one, resulting in an unnatural assemblage of genera.

The sub-family Synthemiinae, proposed by Needham and Hart* but not defined, by inference includes the second legion or group defined by de Selys and later authors, but [illegible] Illinois genera of this legion are mentioned. Later [illegible]

---

* Bull. Ill. St. Lab. Nat. Hist. Vol. VI, Sept., 1901, p. [illegible]

† Aquatic Insects in the Adirondacks, N. Y. St. Mus. Bull. 4[illegible] 1901, p. 479.



WILLIAMSON ON ODONATA.

Above, *Neurocordulia yamaskanensis* ♂. Ottawa, Canada.
Below, *Platycordulia xanthosoma* ♂. Wister, Oklahoma. From type.

defined Macromiinae (= Synthemiinae*) but only the faunal genera, two in number, are considered and the contents of the sub-family are not indicated. The genera segregated by his first character, *the triangle of the hind wing placed considerably beyond the arculus,* are not identical with the genera segregated by his second character, *the anal loop well developed and hardly longer than broad.* The third character, *with more than 2 cubito-anal cross-veins,* like the characters on which the two groups of de Selys were founded, is not a character upon which major groups can be based. In *A Genealogic Study of Dragonfly Wing Venation,* 1903, Needham indicates *Synthemis* as belonging to the Macromiinae.

Omitting for the present the three Corduline genera with 4-sided triangles in the front wings, on venational characters five groups of Cordulinae of approximately co-ordinate rank, I believe, may be defined. The contents of these groups are as follows†:

I. *Hemicordulia, Procordulia, Somatochlora, Paracordulia, Doro- ordulia, Cordulia, Helocordulia, Tetràgoneuria, Epicordulia* and *pitheca;* represented in the Oriental, Australian, Ethiopian, Palae- rctic, Nearctic and Neotropical regions.

II. *Neurocordulia, Aeschnosoma* and *Libellulosoma;* represented in e Nearctic, Neotropical and Ethiopian regions.

III. *Oxygastra, Syncordulia, Neocordulia* and probably *Gomphoma- mia;* represented in the Australian, Palaearctic and Neotropical ions.

V. *Nesocordulia, Idomacromia, Idionyx* and probably *Macromidia;* esented in the Ethiopian and Oriental regions.

Epophthalmia, Macromia, Azuma, Didymops, Phyllomacromia Synthemis; represented in the Oriental, Australian, Ethiopian, arctic and Nearctic regions.

me of the characters upon which this grouping is based s follows:

M_4 and Cu_1 in front wing convergent. Group I.

${}_4$ and Cu_1 in front wing parallel. Group III excepting *Gomphomacromia.*

${}_4$ and Cu_1 in front wing slightly divergent. Groups II and IV and *Gomphomacromia.*

Proc. U. S. Nat. Mus., vol. xxvii, page 698, foot-note *a*.

ttempt at an orderly arrangement of the genera within each s been made.

M_4 and Cu_1 in front wing widely divergent, Cu_1 strongly curved. Group V.

2. M_3 and M_4 in front wing distinctly divergent. Group III
   M_3 and M_4 in front wing convergent or only slightly divergent. Groups I, II, IV and V.
3. Anal loop long, apex widened. Groups I and II.
   Anal loop long, apex rounded, not widened. Groups III and IV (obscured in *Gomphomacromia* and *Macromidia*).
   Anal loop rounded. Group V.
4. Proximal angle of the subtriangle in front wing proximal to the level of, or only slightly beyond arculus. Groups I, II and III
   Proximal angle of the subtriangle in front wing distal to the level of the arculus by at least the length of the anterior side of the subtriangle. Groups IV and V. (In Group IV the postanal cell* forms more of the posterior side of the subtriangle than the cell just proximal to the postanal cell; in Group V, excepting in *Phyllomacromia* where they are about equal, the postanal cell is much the shorter).
5. In front wing the postanal cell* divided (2-celled). Groups I and II.
   In front wing the postanal cell* undivided. Groups III, IV and V.
6. Proximal side of triangle in hind wing on level of or proximal to arculus. Groups I and II.
   Proximal side of triangle in hind wing distal to arculus by less than length of arculus. Group III
   Proximal side of triangle in hind wing distal to arculus by at least the length of arculus. Groups IV and V

The consideration of these characters and the resulting groupings makes it impossible to reduce the sub-family to a smaller number of co-ordinate sub-groups than five. The stalking or distinct origin of M_{1-3} and M_4 at the arculus has not been used because of its indefinite character in many cases. The origin is generally distinct in Group I and in *Neurocordulia* and *Oxygastra* and stalked in all others reaching the extreme development in *Phyllomacromia*, *Didymops* and *Idionyx*. Other characters not here mentioned are available for defining groups or genera. For example, Group III has 3-5 cross veins between M_{1-3} and M_4 in front wing and 2-

---

* Postanal cell, a small distinct area in the front wing posterior to the subtriangle, homologous with the anal loop of the hind wing in the Corduliinae.

hind wing; Group IV has 8-12 cross-veins in front wing and 4-5 in hind wing.

Of the three genera with 4-sided triangles in the front wing, *Cordulephya* is remarkable by the great divergence of M_3 and M_4, and the convergence of M_4 and Cu_1 in the front wing, and the reduction of wing area. It suggests *Syncordulia.* *Neophya* is its exact opposite in all these characters and suggests *Idionyx*. *Pentathemis* has as little in common with the other two as they have with each other, the 4-sided triangle of the front wing resulting from an entirely different switching of veins. It is related to *Aeschnosoma* and perhaps should be placed in the same group.

PLATYCORDULIA new genus.*

Related to *Neurocordulia, Aeschnosoma and Libellulosoma.* Distinguished at once from all by the apically broadened and rounded anal loop which is widely separated from the wing margin by 2 rows of cells (one row in all the others). Of the four genera it has the densest reticulation. The two genera *Aeschnosoma* and *Libellulosoma* are closely related to each other and are distinguished from the other two, among other characters, by the strongly waved M_3 and M_4 in both front and hind wings and the unsymmetrical and peculiar forking of M_1 and M_2 in both front and hind wings. Two species of *Neurocordulia* are known. The venational difference between them is slight, consisting of a greater number of antenodals in both front and hind wings in *yamaskanensis* as compared with *obsoleta* and scarcely definable differences in the form of the anal loop (differences in the form of the two distal angles and the direction of the distal side with reference to the long axis of the wing). Some of the venational differences between the two species of *Neurocordulia* and *Platycordulia xanthosoma* n. sp. are discussed below. The denser reticulation of *Platycordulia* is a striking character, recognized at once by the increased number of rows of cells between the sectors at a relatively proximal position in the wing. Type of *Platycordulia*: *P. xanthosoma,* n. sp.

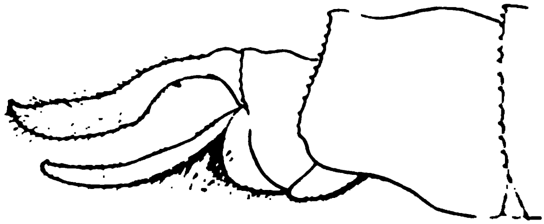
---

* The name refers to the broadened anal loop in the hind wing.

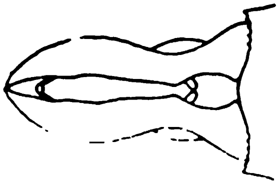
Platycordulia xanthosoma n. sp.

Length of abdomen, including appendages, 38 mm.; hind wing, [illegible] mm.; hind femur, 9 mm.

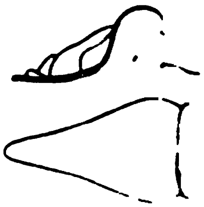
Entire insect yellow or yellowish. Abdomen, excepting segment 1, basal half of 2 and all of 10, darker than thorax; 5-8 or 9 each with a lateral basal paler spot. Head rounded, eyes contiguous for a distance about equal to the width of the vesicle. Wing membrane pale yellowish with clear yellow markings as shown in the figure of the wing (the photographic process produced in the figure a greater contrast in the color of the membrane in general and the yellow markings than appears to the eye.) Membranule white, posteriorly the [illegible] brown, this brown color in the hind wing extending across the [illegible] triangle and broadly margining cross veins in the immediate [illegible] area, not extending into the anal loop.



Platycordulia xanthosoma ♀—Profile view of segments 9 and 10.



Dorsal view of appendages.



Profile view of accessory genitalia of abdominal segment 2, above; [illegible] view of inferior appendage, below.

Some venational characters may be briefly compared with the two species of *Neurocordulia*. Certain characters of [illegible] males and 7 females of *N. yamaskanensis* were kindly furnished me by Prof. E. M. Walker. The supertriangle of front wing is free in 20 wings ♂ and 12 wings ♀ *yamaskanensis* and [illegible] wing ♂ and 4 wings ♀ *N. obsoleta*, crossed in 2 wings ♂ and 4 wings ♂ *yamaskanensis*, 1 wing ♂ and 1 wing ♀ *obsoleta* and 4 wings ♂ of *P. xanthosoma*. Supertriangle of hind wing free in 22 wings ♂ and 16 wings ♀ *yamaskanensis*, 2 wings ♂ and

4 wings ♀ *obsoleta*, and 4 wings ♂ *xanthosoma;* crossed in 1 wing ♀ *obsoleta*. Two cubito-anal cross-veins in front wing in 21 wings ♂ and 16 wings ♀ *yamaskanensis*, 2 wings ♂ and 5 wings ♀ *obsoleta;* 3 cross-veins in 1 wing ♂ *yamaskanensis* and 3 wings ♂ *xanthosoma;* 4 cross-veins in 1 wing ♂ *xanthosoma*. One cubito-anal cross-vein in hind wing in 1 wing ♂ *yamaskanensis;* 2 cross-veins in 21 wings ♂ and 16 wings ♀ *yamaskanensis*, and 2 wings ♂ and 5 wings ♀ *obsoleta;* 3 cross-veins in 4 wings ♂ *xanthosoma*. In 2 males *yamaskanensis* and 1 ♂ *obsoleta* the anal triangle is 2-celled, in 2 ♂ *xanthosoma* 3-celled. Antenodals in front wing—*yamaskanensis* 9-11, *obsoleta* 7-8, *xanthosoma* 7-8; postnodals in front wing—*yamaskanensis* 6-9, *obsoleta* 7-10, *xanthosoma* 7-8; antenodals in hind wing—*yamaskanensis* 6, *obsoleta* 5 (rarely 6), *xanthosoma* 5: postnodals in hind wing—*yamaskanensis* 7-10, *obsoleta* 8-10, *xanthosoma* 7-8. Rows of cells after triangle in front wing—*yamaskanensis* 2, *obsoleta* and *xanthosoma* 2 or 3: in hind wing—*yamaskanensis* 2 or 3, *obsoleta* 2, and *xanthosoma* 2-4 indefinite. Material studied by me—*yamaskanensis* 2 ♂, 1 ♀; *obsoleta* 1 ♂, 2 ♀ and wings figured by Martin p. 38, *Cordulines, Coll. Zool. Selys Longchamps;* and *xanthosoma* 2 ♂.

The abdominal appendages of *Platycordulia xanthosoma* are figured. They are separated at once from species of *Neurocordulia* by the inferior tooth of the superior appendages.

The two males of *P. xanthosoma* in my collection were taken at Wister, Oklahoma, one of them on June 4, 1907, by myself, the second on August 2, 1907, by Frank Collins, a boy who did some collecting for me. Wister is situated in the northeast part of the Choctaw Nation, a few miles south of parallel 35 deg. N., near the Poteau River, a southern affluent of the Arkansas. About a mile north of the town is a lake lying on the west side of the railroad. I was informed that this lake is artificial, caused by the fill for the railroad grade. At the present time the lake has a surprising Odonate fauna. To mention two cases, *Libellula cyanea* and *Ischnura kellicotti*, hitherto not known west of Indiana, were here in abundance. The gap in the known distribution of these two species is thus over 500 miles. The overflow from the lake is a small stream averaging when I saw it 2 or 3 feet in width. Its length from the lake to its mouth in the Poteau River is possibly half a mile. A short distance below the lake, in passing some bushes which overhung the stream bed, I disturbed the only specimen I saw alive of *P. xanthosoma*. This flew a short distance along the stream and alighted in a well concealed spot in bushes overhanging the water. Its flight, manner of alighting and position at rest suggested a teneral *Libellula*. The specimen taken by Frank Collins is somewhat worn; he wrote on the envelope "Yellow one." His home in 1907 was a camp along the Poteau River and his collecting was done along the river, at the lake and at intermediate points.

Professor Walker has recorded the interesting fact that *N. yamaskanensis* is entirely crepuscular in its habits, spending only a brief period of the day on the wing. It is not improbable that *N. obsoleta* and *P. xanthosoma* similarly are abroad only in the evening.

◆

Ceratophyllus niger n. sp. (Siphonaptera).

By Carrol Fox, P. A. Surgeon, P. H. and M. H. S.
San Francisco.

Female.—Head gently rounded to frontal notch which is [illegible] Three stout bristles in lower genal row; three more slender in upper row. Genae acutely pointed posteriorly. Eyes oval. About nine [illegible] on second antennal joint, longer than third joint. One large bristle [illegible] disc of vertex behind middle of antennal groove. The usual bristles [illegible] hind margin of head and one large one at lower angle. Numerous [illegible] ute hairs along posterior margin of antennal groove. Labial palpi [illegible] jointed and extend almost to end of anterior coxae. Maxillae [illegible]

Thoracic nota with two transverse rows of bristles, the [illegible] with about eight bristles. Ctenidium on prothorax of about [illegible] six spines. Second, third and fourth abdominal tergites with [illegible] stout teeth, fifth with one tooth on each side. Two rows of [illegible] on abdominal tergites, the posterior row consisting of about [illegible] bristles; the anterior row fewer in numbers and smaller, and irregularly disposed. Abdominal sternites with one row of about eight bristles. A few smaller along median line on ventral surface. Style slender [illegible]

g apical spine and proximad to this one smaller on upper and one
under surface. Sub stylar flat with about seven bristles on margins.
ree antipygidial bristles on each side, the middle one in each group
e longest. Below pygidium on each side are two bristles.

No minute teeth on inner side of hind coxae. Six hairs on lateral
pect of hind femur. Five spines all in line on each side of fifth
rsal joint. Arrangement of spines on fore tibia as usual in *Cera-*
phyllus. Apical spines on second tarsal joint not longer than third
int. Length of joints of hind tarsi: 20-15-10-5-10.

Color, very dark brown. Length, 3.5 mm.

Male.—Head more abruptly rounded. Two small bristles above
per genal row along anterior margin of antennal groove. About
x minute hairs above eye. Third abdominal segment with one tooth,
urth and fifth with two teeth on each side. One antipygidial bristle
each side. Lateral portion of ninth tergite expanded into a rather
oad lobe, with a somewhat flattened top, and springing from this top
a long bristle. Two long bristles arise just above the insertion of
aspers. Upper claspers large with a stout pedicle, and with the
dicle might be described very well as gourd-shaped. On the upper
unded posterior angle and extending on to the posterior surface are
ve slender bristles. The anterior surface of claspers contains a large
allow notch and along the margin of this notch are four minute
airs.

The ventral style is long, becoming more narrow toward the tip which
ntains four long bristles. Length, 2.5 mm.

Six specimens—three females and two males from Man:
e male from *Mus decumanus*.

N THE October issue of the ENTOMOLOGICAL NEWS, on page 385, I find
elf charged by one signing himself "H. S." with a serious, but obvi-
y foolish, thing—that of putting my name to a piece of work (Kansas
ion Bulletin, No. 154) with the preparation of which I had nothing
I beg to call the attention of "H. S." to the fact that his quota-
of the footnote, occurring on page 165 of that bulletin, upon which
ses his charge of suicidal misconduct, is an *incorrect* quotation.
S." quotes as follows: "The work on this bulletin as printed was
ndently planned and executed by Mr. Dean, who also made the
graphs for illustrations." The *original* footnote reads: "The
upon which this bulletin is founded was independently planned
ecuted by Mr. Dean, who also made the photographs for illus-
s." The "H. S." version is a misstatement of facts. The data
llected by Mr. Dean and partly published by him in 1903 (see
64-170, "Transactions of the Kansas Academy of Science").
Station, Bulletin No. 154 was planned and written by me. In my
give Mr. Dean full credit for his work, I inserted the footnote
H. S." has misquoted and used as a basis for his most unjust
n.—T. J. HEADLEE.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., NOVEMBER, 1908.

The following letter has been received:

"A strange animal has made its appearance in the —— Department of the City Hall. The head of the Bureau thinks a large spider has changed by metamorphosis into a large green moth. I know this to be impossible, but I am anxious that an expert shall investigate the matter, as I am no authority on such subjects. The moth is undoubtedly a very strange one, and is entirely unfamiliar to me.

"If you can call and look at it, I think you will be interested."

There are so many things to know these days that considerable discrimination should be used in making a selection for school children. They are probably taught some things less useful than an elementary knowledge of Entomology and other branches of natural history. There may be some excuse for the grown people of to-day who know nothing about the transformations of insects, but the children of the present time should be better taught. The large spider mentioned in the letter was *Argiope riparia* and the moth *Pholus pandorus*.

◆

TRIGONALYS AND ROPRONIA IN VIRGINIA.—Three species of Trigonalidae I have taken near Falls Church, Va. *Lycogaster* [illegible] at [illegible], Va., 4 May, and Falls Church, 30 May. *Lycogaster costalis* at Great Falls, Va., 25 June, and 11 July. *Trigonalys pulchella*, Great Falls, Va., 12 and 25 June. Schulz in the Trigonalidae of the Genera Insectorum puts *costalis* as a synonym of *pulchellus*. This is evidently wrong. Both were described from males, and *costalis* has the male ventral structure as in *Lycogaster*, just as originally stated by Cresson.

Last winter I left a peculiar Hymenopteron with Mr. Crawford, together with some bees. Later he identified it as *Ropronia pediculata* [illegible] *garmani*. This season I have taken two *R. garmani*, Falls Church, [illegible] June, and Great Falls, Va., 25 June, and one *R. ashmeadi* at Falls Church, 5 July.—NATHAN BANKS.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

UNTIL further notice, Dr. P. P. Calvert will be unable to undertake
e identification of Odonata. Correspondents will please not send
m specimens for this purpose.

THE annual flight southward of *Anosia plexippus* began on October
l, continuing for several days, during which many stores in the busi-
ss district were invaded by these interesting creatures. Their number,
wever, was probably a trifle short of what it has been on former oc-
sions. A fine albino specimen of *A. plexippus* was taken by the writer
ring the flight. *Catopsilia eubule* also seemed less in evidence than
rmerly. *Ulolodes hyalina* was taken here last July at a light. *Calop-*
ryx maculata was quite abundant. Not a few collectors took *Stiria*
gifrons. *Pamphila leonardus*, both male and female, are among this
ason's catch. A somewhat worn specimen of *Pamphila delaware* was
so captured on the Missouri side of the "Father of Waters," but con-
uous diligent search failed to reveal another. Collecting Lepidoptera
re this summer and fall was somewhat of a disappointment, as there
med to be a dearth of everything, except *Debis portlandia* and *Nath-*
iole. The latter fairly swarmed, especially about sandy railroad
ls, for the vicinity of which it seems to entertain a particular fond-
s. This little insect, similarly plentiful in 1904, seemed to have dis-
ared from here entirely during the following years, only to re-
ar this season in uncountable numbers. So far as known, no
as mexicana was seen here this season.—AUGUST KNETZGER, St.
s, Mo., Oct. 12, 1908.

REMARKABLE OUTBREAK OF TIPULA LARVAE.—Early in February,
a number of *Tipula* larvae were sent in to our laboratory from
osa County, California. The letter accompanying them said
hey were occurring in immense numbers and devastating the
lands and wheat fields. The following from a letter from Dr.
Stanley, of Hornitos will show something of their abundance:
present time in all pasture lands you cannot overturn a stone,
bunch of cow manure anywhere without finding from five to
ler each. A few days since, at sundown, I sprinkled a square
land with a solution of cyanide of potassium, a grain to the
Next morning I went to the place and found the ground liter-
red with larvae. You could not put down the point of a pin
without touching one; I counted twenty-eight on one square
is was on a hillside where three weeks ago the ground was

covered with green thrifty grass, but now the whole hillside is bare as a pavement."

Other reports show that the insect is occurring in destructive numbers in several other counties throughout the interior valleys of the State "where great tracts of pasture land have been rendered worthless, resembling land after a prairie fire has swept over it."

The larvae sent to us seemed identical with the larvae of *Tipula simplex* Doane, and adults issuing a few days since shows this identification to be correct. Mr. W. F. Derby, an assistant in the Entomology laboratories here, very carefully worked out the life history of this and other species here last year and has his results ready for publication, and Prof. H. J. Quayle, of University of California, is investigating the extent and seriousness of the outbreak, so I will not dwell on these points. I only wish to call attention to the remarkable fact that in this species which has so suddenly leaped into prominence the female is practically wingless, the wings being reduced to mere vestiges and serving in no way as organs of locomotion. In Ento. News, Vol. 18, No. 1, I described the female and gave some notes on their abundance at Stanford.

Although practically all the members of this genus have rather large, well developed wings, none of them are strong flyers, many of them indeed using their wings quite awkwardly and flying only short distances. Nevertheless, these wings are much better than nothing when it comes to the species distributing itself. The female of *T. simplex* can only move about by crawling slowly and laboriously over the grass. From observations made here they rarely travel more than a few feet before they deposit their eggs in the ground, after which they soon die. Occasionally some of the females or the larvae or pupae are washed away in the little temporary streams that traverse these lands during or after a hard rain and this doubtless helps some in distributing the species.

However, this wingless condition may have come about, whether by natural selection, heterogenesis or what not, the fact that this species is so widely and abundantly distributed over the State when we would naturally expect it to occur in limited numbers and restricted areas shows that the adaptation is an extremely successful one. It is interesting to note in this connection that in another species of this same genus, *Tipula vestigipennis* Doane MS. both the male and female are practically wingless, yet the species is very abundant in certain localities, but has only been reported from San Francisco and nearby regions.

I find records of two other outbreaks of Tipulid larvae in California but in neither instance was the species identified.—R. W. Doane, Stanford University, Cal.

About Grasshoppers.—A Menace to Crops When They Appear in Great Numbers.—The boys who walk through the fields and see a few grasshoppers jumping about little think perhaps that creatures apparently so harmless actually eat people out of house and home sometimes in the West. They come in great droves and multiply into greater droves and then overrun the country and eat the crops.

They were so bad in a certain county of Utah a few years ago that they defied all the efforts of the farmers to get rid of them, and the result was that all the crops were destroyed. The following year the farmers adopted a novel means of fighting the pests. They arranged a series of entertainments to be given in the several towns of the county, admission to which might be had on presentation at the door of a half bushel of grasshoppers as a "ticket"—dead grasshoppers, of course.

The notion caught and spread like a prairie fire, and at the first entertainment 150 people appeared, each with a half bushel of the pests. That county saved its crops.—*Newspaper.*

Doings of Societies.

The Brooklyn Entomological Society met June 4th at 55 Stuyvesant Ave., Brooklyn, with 21 members and 9 visitors present, including Prof. Silvestri, the eminent Italian entomologist and Prof. Wm. Morton Wheeler, of Harvard University, Dr. J. J. Schoonhoven, president of the Brooklyn Institute, department of Microscopy, was elected an active member.

Prof. John B. Smith exhibited enlarged microphotographs of genitalia of the European *Hydroecia nictitans* taken by F. N. Pierce of England. The latter scholar has divided the species into four, largely on constant characters of genitalia. In his revision of the American *nictitans* a few years ago Prof. Smith split the species in three, much on the same grounds.

Prof. Smith spoke on observations on *cecropia* cocoons. Of these 1052 had been collected for data, the sound ones being for the most part purposely rejected. Of one lot 9 were healthy, 42 parasitized and 233 dead of disease. In a second lot 152 were parasitized and 305 died before pupation. The parasites were *Ophion* and two species of *Pimpla.*

The inference was that in the campaign against insect pests most important results might be obtained through study of disease inoculation. Two species of bacterial disease were present in the tested *cecropia*. In June a host of secondary parasites emerged. John A. Grossbeck actually counted 30,000 and estimated the remainder at 20,000. This averaged over 300 parasites per cocoon.

Our observers had little information on the life history of secondary parasites. In one instance the life from egg to imago emergence was ten days. Prof. Silvestri explained that the hyperparasite attacks its host only when full grown in the larval state.

At the conclusion of the meeting the society and visitors were entertained at supper by George Franck.

R. P. Dow, *Recording Secretary*.

ENTOMOLOGICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting November 21, 1907.—Dr. D. M. Castle in the chair. Six persons present. Dr. Skinner exhibited specimens of *Argynnis astarte* and spoke of the habits and distribution of the species.

HENRY SKINNER, *Recorder*

Meeting December 26, 1907.—Dr. P. P. Calvert in the chair. Eleven persons present. Dr. Skinner exhibited *Halter americana*, a fossil insect described by Prof. T. D. A. Cockerell. Mr. E. Daecke made some remarks on the predaceous habits of Asiliidae and said he had observed *Proctacanthus philadelphicus* catching species of *Bombus*. He exhibited specimens of *Somatochlora tenebrosa* taken in coitu at Bambur, New Jersey. Dr. Calvert referred to the large appendages of the male in this species. He also spoke of the general belief of the richness of tropical countries in insect life, but said the Odonata are not a striking example of this richness. Of all the Mexican States, Vera Cruz is the one which has been most thoroughly examined in regard to its Odonata. It extends from 17° to 22° north Latitude and from sea level to 18 [illegible] ft elevation, has an area of 20,200 square miles and 118 known species and races of Odonata. The State of New Jersey ex tends from 39 to 41 degrees north latitude and upward to but 1800 ft. with an area of 7800 square miles, and has 108 species. Nine species are common to the States of Vera Cruz and New Jersey. They are *Hetaerina americana, Argia translata, Ischnura ramburi, Anomalagrion hastatum, Anax junius, A. longipes, Libellula auripennis, Pantala flavescens, Sympetrum corruptum.* Mr. Daecke said 34 species of *Chrysops* had been recorded from New Jersey and only 22 species from Africa. The following officers were elected for the year 1908:

Director, Philip Laurent.
Vice-Director, H. W. Wenzel.
Treasurer, E. T. Cresson.
Conservator, Henry Skinner.
Secretary, J. H. Ridings.
Recorder, Henry Skinner.

HENRY SKINNER, *Recorder.*

Meeting January 23, 1908.—Dr. D. M. Castle presiding. Ten persons were present. Dr. Skinner exhibited a geometrid moth that was captured at the Falls of Schuylkill by the Rev. I. F. Stidham. It was a *Plagodis* probably new to science. Mr. J. A. G. Rehn exhibited a large roach, *Blaberus atropos* Stoll, taken at Key West, Florida. This species is common in Cuba and widely distributed through Central and South America, this record however being the first from the United States. Its occurrence is probably due to accidental importation from Cuba. Mr. Rehn also exhibited specimens of the Acridid genus *Proctolabus,* which for over forty years had remained a monotypic genus but which is now known to contain three species in addition to the type, all of which were exhibited. The type species, *P. mexicana* came originally from Toluca, Mexico, the new forms being from Jalisco, Mexico, Costa Rica and the eastern slope of the Peruvian Andes. The speaker then exhibited specimens of three genera of Acrididae possessing somewhat similar development of the median carina of the pronotum, although from widely separated localities and belonging to two distinct sub-families. The genera shown were

Tropidolophus from the Great Plains and semi-arid country of the West, *Pyrgodera* from Central Asia and a new genus from Central Brazil. Dr Calvert exhibited paraffine sections of prawns which had been injured by book-lice (*Atropos*). He placed naphthaline in the box and found it was fully effective in killing the book-lice. Dermestids also attack these sections. Mr. Bradley exhibited stereoscopic pictures, photographs of Oryssidae and various genera and species. Some of the pictures were of anatomical details of these insects. A method of making stereoscopic pictures with an ordinary monocular lens was explained. This is done by using a diaphragm perforated on one side and then reversing it. He also showed mouth parts (slides) of Siricidae. The mouth parts of *Paururus* and *Tremex columba* were described. The sub-family relations of *Tremex, Teredon, Xerias, Sirex* and *Paururus* were given.

HENRY SKINNER, *Recorder*.

Meeting of March 26, 1908.—Philip Laurent, Director presiding. Nine persons were present. Prof. Calvert compared the Odonata found in the West Indies with those in Mexico and Central America, stating that the species common to the two areas include a number of weak-flying, and also strong-flying species. Although the prevailing wind blows from the West Indies toward the continent, there are a number of strong-flying dragonflies found in the West Indies, and not in Mexico and Central America. Mr. Rehn mentioned the occurrence of a species of walking-stick of the West Indian genus *Aplopus*, on Swan Island which is nearer to the coast of Honduras than to any island of the West Indies. Dr. Skinner said that the geographical distribution of some species appeared inexplicable and cited a number of interesting cases.

Mr. Philip Laurent, referring to Circular No. 97 issued by the U. S. Department of Agriculture, entitled the Bag-worm stated that it seemed strange that the willow, one of the commonest food plants of *Thyridopteryx ephemeraeformis* was not mentioned in the list of food plants. Mr. Laurent stated that next to arbor-vitae, the commonest food plant of the larva is the species in question was the various species of willow, at least as far as the vicinity of Philadelphia is concerned.

FRANK HAIMBACH, *Secretary pro tem.*

Meeting of May 28, 1908.—Dr. Philip P. Calvert in the chair. Seven members and two visitors present. Mr. Daecke spoke of a collecting trip to Browns Mills, New Jersey, on May 27th. He reported the following species: *Pamphila hianna* Scudder. Other than this and his Iona records there is no other actual record for the State. The difficulty of capturing *Poaphila quadrifilaris* was mentioned. The other records in the New Jersey list for this moth are all Newark. *Euherrichia granitosa* Guen., one specimen from the same locality captured a year ago was the first record for the State. *Orthofidonia vestaliata* Gn. Two records, one from northern Jersey and one from Ocean County. *Crambus daeckellus* Haimbach, recently described. *Chrysops indus,* a new locality for this insect. *Tetyra bipunctata* a rare Hemipterous insect. A female *Hemaris gracilis* was observed ovipositing on huckleberry. A living ant-lion (larva) was exhibited. The species unknown. It was described as follows; Head, thorax and first two abdominal segments, brick-red; next segments with a heavy black crossband, the remainder of abdomen grayish-white with a longitudinal row of black spots.

Dr. Calvert spoke of the genus *Somatochlora* and the species *tenebrosa* and *filosa* as having been recorded from North Carolina by Brimley. Mr. Brimley had sent him specimens and also a cast skin of *tenebrosa.* Mr. Brimley's determinations of the species were found in accord with his own.

Mr. Daecke said *Tabanus mexicanus* flew around cattle toward night. He said the fact that *Diachlora ferrugatus* and *Dorcas brevis* had been found at Weymouth, New Jersey, made the locality an interesting one.

HENRY SKINNER, *Recorder.*

Meeting of September 24, 1908.—Vice-Director, H. W. Wenzel, presiding. Eleven persons present. Mr. Rehn exhibited a wingless katydid, *Cyphoderris monstrosus,* collected by Prof. Stewardson Brown, on the Saskatchewan river, Alberta, Canada. It has also been found in Montana. He also exhibited *Hesperotettix brevipennis* described by Uhler. In 1891 Prof. Morse took one at Wellesley, Massachusetts, and at subsequent dates during four or five years, he took quite a number. The speaker captured nine specimens at Stafford's Forge, Ocean County, New Jersey, during August and early September. The species was taken in a very limited area.

Dr. Skinner exhibited *Pieris napi acadica* Edw. from Newfoundland, new to the collection and presented by Dr. William Barnes.

Mr. Haimbach spoke of the great abundance of a noctuid moth, *Galgula hepara* throughout the city at the present time. He had never seen it in such numbers previously.

Dr. Calvert exhibited a specimen of the moth *Erebus odoratus* Linn. which had been found in the second story of Biological Hall, University of Pennsylvania, Philadelphia, Aug 27, 1908, during a storm which is said to have come from the Gulf of Mexico; an immature male of *Libellula incesta* Hag from Clementon, N. J., June 4, 1908, interesting for possessing a pale fuscous streak in the first post-nodal space of the wing suggesting *L. axillena* Westw.; a male of *L. axillena*, type form from the same place and date, the first record from New Jersey; *Argia translata* Hagen from Chester Creek, Glen Riddle, Delaware County, Pennsylvania, July 16, 1908, and Lake Hopatcong, New Jersey, July, 1906, this last by Mr. S. N. Rhoads; *Lestes disjunctus* Selys, Tobyhanna, Monroe County, Pennsylvania, September 18th, 1906, by Mr Bayard Long, first record for Pennsylvania; *Gomphus spiniceps* Walsh, Fairmount Park, Philadelphia, June 27th, 1906, Chester Creek at Glen Riddle, Pennsylvania, July 10th, 1908, with their exuviae by Mrs. Calvert, and Crum Creek above Strathaven, Pennsylvania, July 28th, 1908; this *Gomphus* is an addition to the Odonate fauna of Eastern Pennsylvania; many more of its exuviae were found than imagos seen

Mr. Chas J. Cole, Jr., was elected an Associate

HENRY SKINNER, *Recorder*

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

These notices are continued as long as our limited space will allow; the new added at the end of the column, and only when necessary those at the top ›ngest in) are discontinued.

---

re larvae of *Catocala illecta* feeding on honey-locust, and shall hrysalids in a few weeks. From eggs of *C. piatrix* and *C. vidua* ›on have larvae. Larvae of other later. Want *C. parta* and *C. x*.—R. R. Rowley, Louisiana, Mo.

e Entomological Literature for exchange.—M. Bubna, 2629 ill Rd., Cleveland, Ohio.

›e happy in corresponding and exchanging papers and material with economic entomologists, and especially with Miriopodolo- id Acarologists.—Prof. Carlos E. Porter, Casilla 2352, Santiago,

Exchange.—A subscription to the Macrolepidoptera of the world z. All parts complete to date.—Chris. E. Olsen, No. 1 Jefferson Maspeth, L. I., N. Y.

ted for Cash or Exchange.—Cocoons and pupae: *Pap. ajax*, *s*, *cresphontes*, *achemon*, *turnus* and other *Papilio*. *T. modesta*, *rsis*, *luscitiosa*, *A. bicolor*, *angelica*, *P. pandorus*, *Dar. versicolor*, *ylus*, *Cit. regalis*, *imperialis*, *hylacus*, *luna*, *polyphemus*, *Lapara arum*, *C. nudulosa*, *S. germinatus*, *Paonias myops*, *P. quin- culata*, *Attacus cecropia*, *jorulla*, *orizaba angulifera* and all pecies of *Attacus*.—Joseph Sever, 335 E. 49th St., New York City.

re for exchange cocoons and pupae of *P. podilarius*, *machaon*; *ligustri*, *pinastri*, *euphorbiae*, *elpenor*, *porcellus*, *tiliae*, *occelata*, *stellatarum*; *Saturnia pyri*, *pavonia*; *Aglia tau*; *End. versico-* . *lanestris*, *Ph. bucephala*, *C. vinula*, *N. Ziczac*, and eggs of *Cat- raxini*, *nupta*, *promissa*, *elocata* and *electa*.—Joseph Sever, 335 E. ., New York City.

ted for Cash or exchange living pupae *Papilio turnus*, *troilus*, r at 5c. each; *excaecatus*, *geminatus*, *myops* at 5c. each; *modesta* h; *lineata* at 5c., *jorulla* at 7c., *Dat. nimistra* at 5c.—A. F. Por- corah, Iowa.

espondence solicited with collectors who have been victimized ign dealers or collectors. Correspondence confidential. Object tion.—Address A. F. Porter, Decorah, Ia.

ted.—Henshaw's Check List of Coleoptera. Will pay cash.—R. lum, Whittier, California.

doptera Wanted.—Catocala, Papilio, Arctians and other showy ens of larvæ. Will send equally good things in return.—G. Eber- lerlin, Friedenau, Beckerstrasse t. Germany.

er bred Gortynas, fine butterflies, chrysalids of butterflies, hawk- etc., and *Catocala* and other eggs. I want *Catocala* eggs, chrysa- *ajax*, *turnus*, *asterias*, *troilus*, *cresphontes*, etc., or of any butter- awkmoth or offers welcomed.—J. W. H. Harrison, 181 Abingdon iddlesbro', England.

ted.—Clemens' Tineina of North America. State price.—C. T. Public Museum, Milwaukee, Wis.

nt to buy cocoons of *A. luna*, *A. angulifera* and *gloveri*. Pupae *chemon* and *D. lineata*. Please state prices.—Sydney L. Wright, gan, Philadelphia.

h mounted examples of Macro- and Micro-lepidoptera from this offered in exchange for Macro-lepidoptera of North America new collection.—Fred. Marloff, Oak Station P. O., Alleg. Co., Pa.

Geometridae.—Will exchange or pay cash. Wanted especially [illegible] series *Eupthecias* from Maine and the Provinces, Canada and the North-west, also western, southwestern and southern forms.—Address R. F. Pearsall, 1334 Dean St., Brooklyn, N. Y.

Liberal exchange in European and Missouri Lepidoptera for [illegible] and natives not in my collection.—Aug. Knetzger, 3822 McDonald St., St. Louis, Mo.

Fertile eggs of *Catocala ilia*, ***neogama***, ***piatrix***, ***robinsoni***, [illegible] *relecta*, ***innubens***, ***cara*** and ***amatrix***. For sale or exchange.—George M. Dodge, Louisiana, Mo.

Specimens of Lepidoptera for exchange from this locality.—Fred Burns, 636 Center St., Reno, Nevada.

INSECTS OF NORTH CAROLINA

I am desirous of securing accurate data concerning occurrence of all species of insects in this State. Correspondence desired with parties or museums having North Carolina material. Willing to pay for accurately prepared [illegible] of any considerable number of species. Correspondence wanted with persons desiring material in certain groups from this State. Will gladly give suggestions to persons desiring to find suitable collecting grounds in this State for work at any season. In short, want the varied and interesting entomology of this State to be known and recognized by entomologists, and willing to assist in every way to make it known and get it recorded. About 300 miles of coast line and numerous mountain ranges and peaks 5000 to 6700 feet elevation, touches of subtropical and boreal faunas and all intergradations. In writing mention this advertisement

FRANKLIN SHERMAN, JR., Entomologist

State Department of Agriculture, Raleigh, North Carolina

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,

6, Gunterstone Road, West Kensington, London, W

Cat. No. 17 for 1908 now ready mailed free on demand

The only dealers' list giving authors' names throughout. [illegible] specimens, equal [illegible] ex Assam, 40 different species in papers, including [illegible] *les*, *gras*, etc., mailed free on receipt of Post Office Order $4 [illegible] Catalogue, with over 300 descriptions and many interesting notes [illegible]

PARCELS SENT ON APPROVAL FOR SELECTION.

FOR SALE. COMPLETE SET OF EDWARDS' BUTTERFLIES
Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

NATURHISTORISCHES INSTITUT "KOSMOS."

HERMAN ROLLE, BERLIN, W. 30, SPEYERER STR. 8

Offers Catalogues as follows
Supplement to the Catalogue of [illegible]
Catalogue of [illegible] Coleoptera [illegible] Catalogue of [illegible]
Catalogue of Palaearctic Lepidoptera [illegible]

All catalogues [illegible] arranged in systematical order following the best [illegible] with [illegible] families, subfamilies, localities, synonyms etc.
Best help for the arrangement of the collections.

The Butterflies of the West Coast

A new book. Text, descriptive and critical, of all known species, illustrated with thirty-two full page plates in best modern photographic color work, with nearly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practically out of print; is not in any dealers' stock, and only a few copies now remain in the author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAST

An abridgement of the above, consisting of the full set of plates as issued in that book, with names of all species printed on pages facing the plates, but with no descriptive text; issued as the best possible substitute for that more expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book address the author.

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

African, South American or Indian butterflies in papers. 100 (40 to 60 different), $2.50; second quality, $1 25. 50 different tropical Papilios, several new from New Guinea, South Sea Islands, etc., named and set, $10.00. All postage free. British and Tropical Lepidoptera, Coleoptera, etc. Lists of check lots post free.—A. FORD, Entomologist, 36 Irving Road, Bournemouth, England.

V. L. KELLOGG'S INSECT STORIES.

By the author of "American Insects," "Darwinism To-Day," etc.
In the American Nature Series. Illustrated. $1.50 net.

Strange, true stories of insect life, primarily for children, but also appealing to grown-up nature lovers.

The *Nation* says: "The author is among the few scientific writers of distinction who can interest the popular mind. No intelligent youth can fail to read it with delight and profit.

HENRY HOLT & CO., 34 WEST 33d STREET
NEW YORK

FOR SALE.—Lepidoptera and Coleoptera of San Diego Co., Cal.: Tharsalea hermes, Lemonias augusta, Argynnis semiramis, Nathalis iole, Prenes errans, Hemileuca electra and many other nice things.

L. E. RICKSECKER, 3637 Vermont St., San Diego.

FOR SALE

The following Arizona Coleoptera: *Amblychila baroni*, 4.00; *Cicindela pimeriana*, [illegible]; *C. arizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclaræ*, .40; *C. hornii*, .50; *Pasimachus mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. mori*, .75; *C. [illegible]*, .75; *C. arizonicus*, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Moneilema gigas*, .40; *[illegible] tessellatus*, .75; *Leptostylus yuccæ*, .50; *Urodera crucifera*, .20; *Nodonota [illegible]*. Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus [illegible]*; *Oxycnemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia [illegible]*, .40; *Spragueia plumbifimbriata*, .25; *Hatima zethus*, .75; *Triprocris rata*, .30; *[illegible] [illegible]cula*, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of N[illegible] American insects of all orders for sale, or exchange furnished on application.

F. H. SNOW - - - LAWRENCE, KANSAS

The Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

Cocoons of HYPERCHIRIA PAMINA Neum.

and Var. AUROSEA Neum.

ARIZONA. FOOD PLANT, OAK. PRICE, $1.

Otto Buchholz, 382 Littleton Ave., Newark, N. J.

LIVING COCOONS AND CHRYSALIDS

[illegible]

O. FULDA, 816 Broadway, New York

[illegible]

OURNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

... E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec. Asso. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rogue, Louisiana

Advisory Board { L. O. Howard — James Fletcher — Herbert Osborn
S. A. Forbes — H. A. Morgan — H. T. Fernald

bi-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

rms of Subscription:—In the United States, Cuba and Mexico, two dollars annually in advance; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

URNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

BUTTERFLIES AND MOTHS

OR SALE, CHEAP—A collection consisting of nearly 3000 named cimens representing an excellent lot of interesting exotics, as well as a good es of North American species, both diurnals and nocturnals.

ed. M. Mueller, 167 Evanston Ave., Chicago, Ill.

---

000 PIN-LABELS, TWENTY CENTS!

d from the smallest type made. About 20 on a strip. No trimming—One cut makes a label. Send Money Orders must be in multiples of 500, and no order will be filled for less than 500 each of 2 labels or 1,000 of one.

Y. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

AM LOOKING for collectors who deal with insects, pupae, butterflies and larvae from Mexico, Texas, Arizona and California paying cash. Rerding further information, communicate with JOSEPH VER, 335 East 49th Street, New York.

NOVA SCOTIAN INSECTS

IDOPTERA—in papers—pinned—full data given—named—in finest condition—many rare kinds

pecimens of 70 species, $6,00 — **200 specimens of 140 species, $11.00**

Prices include cost of transportation
amed Lepidoptera, Diptera, Coleoptera and other insects of other Orders at very low rates

HN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YO

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.
K.-S. Section Cabinets.
Schmitt Insect Boxes.
K.-S. Lepidoptera Boxes,
and Duplicate Boxes
K.-S. Screw Handle and
Nets.
The Asta Insect Pins:
White, 60c. per
Black, 75c. per

Catalogue II: Entomological
Apparatus.

THE KNY-SCHEERER C

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York,

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPO
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMEN

North American and exotic insects of all orders in perfect
single specimens and collections illustrating mimicry, protective
dimorphism, collections of representatives of the different orders of
Series of specimens illustrating insect life, color variations, etc
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect b
Lepidoptera boxes, etc.), cabinets, nets, insect pins, forceps, etc
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

Stanford
DEC 14 1908

DECEMBER, 1908.

NTOMOLOGICAL NEWS

Vol. XIX. No. 10

Halter americana Cockerell.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:
ZRA T. CRESSON. HENRY L. VIERECK. J. A. G. REHN.
HILIP LAURENT. WILLIAM J. FOX. H. W. WENZEL.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September**, in charge of the Ento-
logical Section of the Academy of Natural Sciences, Philadelphia
and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.

Outside of the United States and Canada, $1.20.

SINGLE COPIES 15 CENTS

Advertising Rates: 30 cents per square inch, single insertion; a liberal dis
on longer insertions. No advertisement taken for less than
60 cents—Cash in advance.

☞ All remittances should be addressed to ENTOMOLOGICAL NE
Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

A □ DEAL

The specimens comprising this offer are first-class and desirable. [illegible] colored specimens made up in assortments with a few fine ones [illegible] the finest that can possibly be offered at so reasonable a price. "*It is a square deal.*" [illegible] no purchaser will throw a greater part of them in the waste basket [illegible]

50 Superb Exotic Lepidoptera $5.00

This lot is composed of fine specimens from Burma, Northern India and the Celebes [illegible] containing many Papilios, among them *Papilio* [illegible] *and* [illegible]. Specimens are in pa

Extremely fine specimens of Coleoptera from India comprising Cerambycidæ, Buprestidæ, Cetonidæ and Curculionidæ, in papers, in perfect condition.

PRICES ON APPLICATION TO THOSE INTERESTED

A FINE LOT OF EXOTIC MOTHS IN STOCK

Send 10 cents additional with each order to cover postage and packing.

JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA,

The Butterflies of the West Coast of the U.

Plates: 940 Colored Life-Size Photo
Figures, all Named, $1.50 Postpaid.

W. G. Wright, 445 F St., San Benardino, C

CATALOGUE OF THE

NEUROPTEROID INSECT

(EXCEPT ODONATA)

OF THE UNITED STATES

BY NATHAN BANKS

Complete to Summer of 1907 Price 50 cts. (net) per copy Mailed on receipt of

☞ Send for copy of New Additions to ☜
Price List; just issued.

E. T. CRESSON, Treas., P. O. Box 248, Philadelphia

When Writing Please Mention "Entomological News."

JAMES FLETCHER, LL.D.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. DECEMBER, 1908. No. 10.

CONTENTS:

James Fletcher, LL.D. 445
Dr. Francis Huntington Snow 447
Ewing—Two new species of Phthiracarus 449
Fox—A new genus of the Siphonaptera 452
Cockerell—A Dragon-fly Puzzle and its Solution 455
Manee—Some Observations at Southern Pines, N. C 459
Mitzman—How a Hungry Flea Feeds 462
Walton—Notes on the Egg and Larva of Goniops chrysocoma (O. S.) 464
Cockerell—A new Bee from Tahiti 466
Walton—Popular Fallacies Regarding Insects; and some Insects that are Poisonous 467
Grossbeck—Additional Notes on the Life History of Culex pertubans 473
Williams—The Life History of Lycaena antiacis Bdv., with other notes on other species 476
Patch—Pemphigus tessellata: Alternate Host, Migrants and True Sexes 484
McAtee—Notes on an Orthopterous Leaf Roller 488
Editorial 492
Notes and News 493
Doings of Societies 494

JAMES FLETCHER, LL.D.

(Plate XIX)

Dr. Fletcher died in the Royal Victoria hospital, Montreal on November 8th, following a surgical operation. He was born in Ash, Kent, England, March 28, 1852. His education was obtained at the King's School, Rochester, England. He came to America when a young man as a junior officer in the Bank of British North America, and soon began to devote his leisure hours to the study of insects and plants. Finding the work of a bank by no means congenial to his literary and scientific tastes, he obtained a position as assistant in the Library of Parliament at Ottawa. It was not long before his talents and attainments in botany and entomology became widely known, chiefly through his contributions to the "Canadian Entomologist" and the annual reports of the Entomological Society of Ontario. His first paper in the latter was an article on Canadian Buprestidae, which was published in 1878, while his first contribution to the former appeared in January, 1880. During all the years that have followed no volume of either publication has been issued without some valuable articles from his pen.

In 1878 he became a member of the Council of the Entomological Society of Ontario, and every year since he has been elected to hold some office in the Society, being four times vice-president, and for three years, 1886-88, president. In 1879 he was one of the originators of the Ottawa Field Naturalists' Club, the most successful society of the kind in the Dominion, and more recently he suggested and by his influence and energy accomplished the promotion of the important Association of Economic Entomologists of North America.

The first official recognition of his attainments was in 1884, when he was appointed Honorary Entomologist to the Department of Agriculture at Ottawa, and in that capacity, though much hampered by his duties in the Library of Parliament, he published a valuable report on the injurious insects of the year. Two years later the position of Entomologist and Botanist to the Experimental Farms of the Dominion was conferred upon him.

In the years that have gone by, he has done an enormous amount of valuable work, as shown in his annual reports and evidence before the standing committee of the House of Commons on Agriculture, his voluminous correspondence with farmers all over the Dominion, and his addresses to Farmers' Institutes and other gatherings.

No one in Canada has done so much to instruct the people in a practical knowledge of the worst insect foes and the best methods of dealing with them, while probably no one but he could have given the Province of Manitoba the information and advice that he has repeatedly afforded by his lectures, addresses and publications on the noxious weeds of that portion of the Dominion.

He was given the honorary degree of Doctor of Laws by Queens College and was a fellow of the American Association for the Advancement of Science; fellow of the Canadian Royal Society; fellow of the London Linnean Society and of the Entomological Society of America. He was first vice-president of the latter Society in 1907 and took a great interest in its formation. In 1891 he was the president of the Association of Economic Entomologists and always took an active part in its affairs.

Dr. Fletcher was a remarkable man in many ways and the word great expresses what he has done to encourage and teach the value of economic entomology and botany in the Dominion of Canada. He had a contagious enthusiasm and kept up the interest of a host of correspondents by aiding them in every way in his power. He was an excellent and lucid teacher, a lecturer of unusual ability and a graceful writer. His name was a household word among entomologists not only in Canada, but throughout North America, and in many parts of the world besides. He traveled extensively and had a large acquaintance wherever he went, and made many trips across the continent, collecting principally along the line of the Canadian Pacific Railway. He was a large and handsome man of commanding presence and had the love and respect of a host of friends and admirers. His loss will be keenly felt and our only consolation is the thought that his grand work and example will live and be a beacon light to those that follow. He leaves a widow and two daughters one of whom is married.

DR. FRANCIS HUNTINGTON SNOW.*

In the year 1866 there came to the University of Kansas from Williams college a young man of twenty-six, full of enthusiasm, eager to do his part in the upbuilding of the school then beginning its first year's work, and pleased with the freshness and beauty of the new country. He spent the remainder of his life in the service of the institution and the state which he had thus early adopted as his own. For forty-two years he gave the best that was in him to this service which, for ten years, called him from his scientific pursuits to the Chancellor's chair. In this position, through a lean and trying period, he guided the destinies of the state university during its transition stage from a small college to a university.

In no uncertain way he thus gave directly from his life, for the irksomeness of the administrative work finally undermined his health and he was obliged to resign his position at the head of the school. After some months' rest he returned to his old school work and for five years was happily engaged in the scholarly pursuits which he so much loved. But the old injury to his health was too severe to be overcome and again he was forced to relinquish his work. For ten weary months he fought a good fight, but at last on September 20 was forced to yield—and so passed away.

---

*Born at Fitchburg, Mass., June 29, 1840.

Such, in brief, is the history of Dr. Francis Huntington Snow's connection with the University of Kansas. What he accomplished for science during this time is known, at least in part, to most entomologists. As an enduring monument of his devotion there is now in the museum of his school one of the largest and most complete collections of insects in the country. Most of this is the result of his own personal efforts, the extent of which may be judged by the fact that he [illegible] twenty-six expeditions into the field. Some idea of the completeness and value of the collections may be gained by noting that the number of type specimens is about 1,500. The largest number of types is found among the diptera where there are 1,026. The coleoptera and lepidoptera are well represented, the former having 11,000 species, and the latter 4,8[illegible] species and 114 types. There are altogether about 250,000 specimens distributed among 21,000 species.

These collections represent what came to be Dr. Snow's [illegible] scientific interest, but during the many years when he had [illegible] or less of the entire science work of the school in charge [illegible] promoted and encouraged the formation of museums [illegible] in general zoology, paleontology, botany and mineralogy. [illegible] of the strong scientific bias of the school is due to his [illegible] interest in these branches of learning which, strangely [illegible] claimed his attention only after he had been obliged to relinquish his early ambition to teach Greek. Second [illegible] to his entomological bent was his leaning toward [illegible]. In 1872 he published the first check list of Kansas [illegible] which he added from year to year until in 19[illegible]3 he [illegible] the fifth and last revision.

Not content with the purely scientific aspect of his work [illegible] constantly endeavored to render it of practical service to the people of his state. For several years, during the chinch bug invasion of Kansas, he labored heroically to aid the farmers in their extremity. However much question there may be regarding the practical effects of his labors there can be none concerning his devotion and singleness of purpose toward the cause of those into whose service he thus entered. Many are firm in their belief of personal indebtedness to Doctor Snow for his assistance in their time of trouble.

Much more might be said of this excellent man, but it would all be of the same kind and tenor. He was one of Nature's noblemen—earnest, sincere and devoted; full of optimism, good cheer and courage. He lived a life of simple earnestness and hundreds of devoted students have felt and acknowledged its influence for good. The University of Kansas honored itself by formal memorial services devoted to his memory on November 10, at which time his old friends and students spoke most appreciatively of his services to science and to the state.

C. E. McClung.

Two new species of the genus Phthiracarus.

By H. E. Ewing, Urbana, Ill.

The genus *Phthiracarus* is one of the two genera which compose the subfamily Hoploderminae, of the family Oribatidae. The members of the subfamily Hoploderminae are remarkable in that the cephalothorax is hinged to the abdomen and is capable of being folded down upon the ventral surface of the latter in such a way as to completely cover and conceal the legs and mouth parts. This arrangement enables these small Acarina to successfully protect themselves from many of their small predaceous enemies. Up to the present time only four species of the genus *Phthiracarus* have been recorded from North America, the two described in this article making six known to this country. The writer is indebted to Mr. H. Glasgow for the collecting of one of the species.

Phthiracarus flavus n. sp.

Light yellow, darker parts light yellowish brown; integument of cephalothorax and abdomen pitted.

Cephalothorax one-half as long as abdomen and twice as long as high, rounded in front. The cephalothorax bears three pairs of prominent bristles; anterior pair about two-thirds as long as the cephalothorax is high; middle pair, which is situated at about the middle of the dorsal surface of the cephalothorax, slightly larger; posterior pair, which is situated above the pseudostigmata, two-thirds as long as the cephalothorax. Pseudostigmata situated approximate to the posterior ventral surface of the cephalothorax, oval in shape; pseudostigmatic organ two-thirds as long as the posterior pair of bristles; without head, but slightly pectinate towards the distal end. Mouth parts large, stout, and prominent. There is a very slight ridge running forwards from the pseudostigmata to the anterior margin of the cephalothorax.

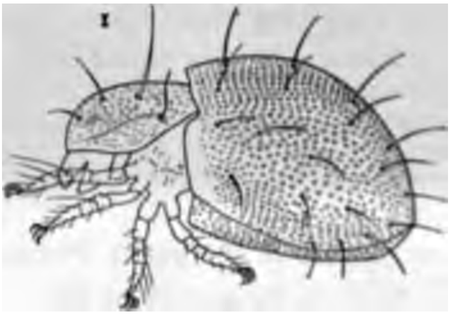


Fig. 1.—*Phthiracarus flavus* n. sp., side view, × [illegible]

Abdomen pointed behind; ventral margin strongly convex, anterior margin with a deep notch to allow room for the pseudostigmata and pseudostigmatic organs. The abdomen is deeply pitted, pits of about the same size and arranged in longitudinal rows. Abdomen with at least nineteen pairs of prominent bristles above, a row of five bristles on either side of the median plane; another row of five bristles just below this row on either side of the abdomen; a pair of bristles just posterior to the notch in the anterior margin of the abdomen; a similar pair situated about their length posterior to this pair, a pair situated about one half the distance from the anterior to the posterior end of the abdomen and their length above the ventral margin of the same; three pairs of bristles situated towards the ventral margin of dorsum, and three pairs on the posterior ventral margin. The genital and anal covers together extend almost the entire length of the abdomen; inner margin of genital covers straight; inner margin of anal covers slightly convex, genital covers each with a few very minute hairs.

Anterior pair of legs equal in length to the cephalothorax, somewhat stouter than the others; tarsus of leg I fully one and one-half times as long as the tibia. All the legs are well clothed with rather long, simple bristles Unguis tridactyle. Length, 0.78 mm; height, 0.42 mm.

In moss. Collected by H. Glasgow at Urbana, Illinois. One specimen.

Phthiracarus rotundus n. sp.

Brown; integument granulate. Cephalothorax, fully one-half as long as the abdomen and about one-half as high as long. There is a small chitinous ridge around the ventral edge of the cephalothorax; this ridge projects forwards and laterally about as far as the width of one of the dactyles of tarsus I. The cephalothorax bears two pairs of very fine hairs, those of the anterior pair being shorter than those of the posterior pair. Pseudostigmata round, disk-like; in diameter each equal to the width of tibia I; pseudostigmatic organ about twice as long as the diameter of the pseudostigma. Palpi very prominent.

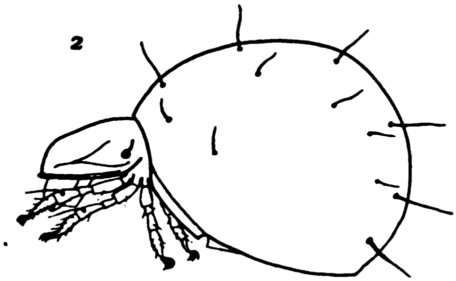


Fig. 2.—*Phithiracarus rotundus* n. sp., side view, x 80.

Abdomen almost as high as long; the upper half of the anterior margin concave, the lower half of the anterior margin straight. The posterior part of the abdomen is rounded; ventral margin of abdomen convex. The abdomen bears about twelve pairs of small hairs on the dorsal aspect.

Legs about as long as cephalothorax; all subequal; tarsus longer than tibia; unguis large and stout, almost as long as the tarsus, from which it extends, and tridactyle, dactyles equal. Length, 0.76 mm; height, 0.52 mm.

Under a log. Collected by the writer near Batavia, Ill.

A new genus of the Siphonaptera.

By PAST ASSISTANT SURGEON CARROLL FOX, P. H. & M. H. S.

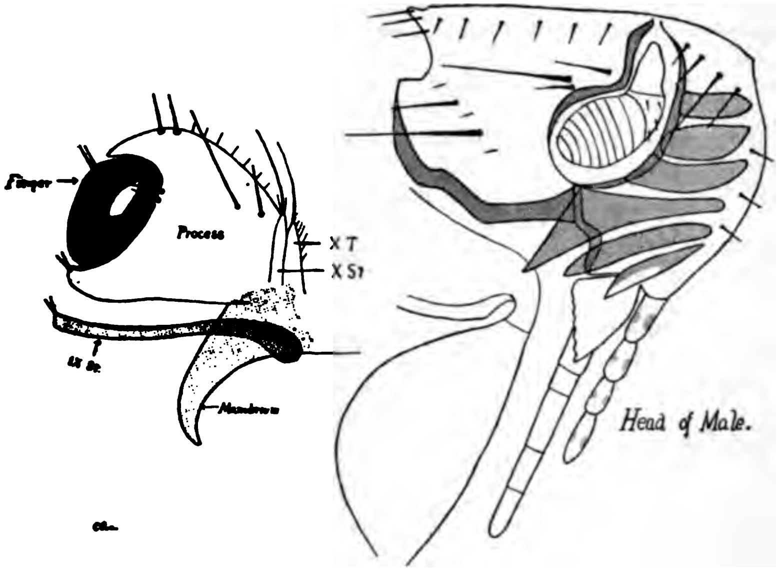
Seven specimens in all, 2 males and 5 females, a description of which follows, have been obtained, from the *Scapanus californicus* taken in San Francisco. Believing them to be new, I sent them to Mr. Rothschild, who kindly looked at them and pronounced them representatives of a new genus, pointing out certain characteristic features.

CORYPSYLLA gen. nov.

Spines on the head, structure of head, spines on back of abdomen, mesothorax not divided by a vertical suture, episternum of metathorax fused with the metanotum. Hind coxae with a patch of spines on inside. All tarsi with four pairs of lateral spines on fifth segment.

Corypsylla ornatus spec. nov.

Head very gently sloping towards the front to just above the root of the first genal spine where it rather abruptly changes its direction and curves downward and backward forming an angle. This anterior border of the frons is more decidedly curved in the female. The gena is broad from above downwards and in the posterior border has a distinct notch. Starting well up on the frons and extending downward so that the last one partly overlaps the maxilla is a row of [illegible] spines six in number. They have their origin close to the anterior margin of the head. The first, or highest of the group extends [illegible] the anterior margin of the antennal groove, and terminates with a square end. The second is a little longer and slightly overlaps the anterior margin of the antennal groove and terminates with a [illegible] rounded end. The third is still longer and overlaps the anterior margin of the antennal groove, the end being as it were, cut off at an angle. The fourth is by far the longest extending to the [illegible]. Its end is much enlarged and terminates with an acute angle. The fifth is longer and narrower than the third, having somewhat the shape of the blade of a penknife. The sixth is shorter than the fifth and rather indistinct in outline. The maxilla is short [illegible] angular in shape with the posterior border distinctly serrated. [illegible] absent. The maxillary palpi are four jointed, not as long as the labial palpi. The labial palpi are five jointed and extend almost [illegible] of the [illegible] in the females, but are somewhat shorter in the [illegible]. Just above the first genal spine is a row of four bristles [illegible] obliquely upward from the root of the first genal spine to the edge of the upper part of the antennal groove. In front of the roots of the spines is a row of three smaller bristles. In the female along the anterior margin of the antennal groove at the termination of the upper three spines is a row of about four stout bristles. Along the dorsal margin of the occiput on each side of the median line is a row of about six bristles. Back of the base of the antenna is one bristle and there are two bristles, the upper the larger, back of the third joint of the antenna about its middle. Midway between the termination of the antennal groove and the lower posterior angle of the occiput is a large bristle and above and behind this bristle, another bristle, and in line with these bristles, and alternating with them are three hairs. In the posterior margin of the occiput, dorsally, is a deep notch and on the borders of this notch are six bristles placed rather close together. The antennal groove is short and extends nearly to the upper margin of the head. The anterior and posterior margins are markedly thickened. The second antennal joint is short and contains about four small hairs. The club is short and nine-jointed. The distance between the anterior border of the frons and the end of the antennal groove is only a little greater than the distance between the end of the antennal groove and the posterior margin of the head, in both sexes.



On the posterior border of the pronotum in the female is a ctenidium of about fourteen spines. This ctenidium is continued downward on each side by about nine very indistinct pseudo-spines, these shadowy spines overlapping the mesothorax. At the lower border of the pronotum is a long bristle, above this another smaller one and near the dorsal margin one more. In the male there is a pronotal ctenidium of about thirty-eight spines. The bases of these spines form a compound curve, above the convexity being anterior while laterally the anterior margin is concave, and this concavity is filled in by apparently a duplicate set of shadowy pseudo-spines, and between each of these pseudo-spines is an indistinct bristle. The mesonotum is short and contains on its dorsal median surface a thickened chitinous patch, this patch being prolonged over the metanotum and containing a few long hairs. The metanotum is the longest of the thoracic nota, thickened on its dorsal median surface and contains in this thickened patch an anterior and posterior row of about six long hairs placed very close together and on its lateral surface is a long bristle.

The mesothorax is not divided by a vertical suture and has, a little anterior to its middle, one long bristle in the female and two in the male, and on its posterior border two long bristles one above and one below the second thoracic stigma. The episternum of the metathorax is fused with the metanotum and contains one short and one long bristle, the metasternum has one short, stout bristle placed high up and the epimerum in the male has four or five large bristles and in the female four.

The Abdomen.--The abdominal tergites from the first to sixth, have in the median line of the dorsal surface a distinct saddle-shaped chitinous patch and a set of short, stout teeth or spines. These spines overhang the chitinous patch of the next posterior segment.

The first, second and sixth have five teeth each, and the third, fourth and fifth seven each. The three middle teeth are in each case the largest and blackest . The seventh tergite contains the thickened patch but in place of the teeth has at its apex, in the female, two short, stout antipygidial bristles and in the male one bristle on each side. Anterior to the spines in each tergite, in the median line are several hairs. Laterally on each tergite are two bristles, one below and one above the stigma. The sternites in the male from the third to the eighth contain a single row of six bristles while in the female there is on the third a row of four bristles and on the second sternite only two bristles. The eighth tergite has just at the upper edge of the pygidium a small hook like process and laterally in the female there are four bristles placed one above the other. Below there is a patch of about seven bristles, more or less in line, on each side and above these close to the margin about eight small bristles. The eighth sternite is very narrow. The stylet is long, narrow, cylindrical, as wide at the tip as at the base with a long bristle at the tip. Surrounding the stylet is a patch of bristles, on the tenth tergite and sternite.

Modified Segments in Male.—The manubrium is narrow, points downward, is slightly curved to a pointed end. The process is very large, gently rounded at its lower margin where at the distal extremity are two bristles. The upper margin is strongly convex and contains on its edge two bristles and numerous hairs. The finger is much smaller than the process, heavy, somewhat crescent-shaped with the pedicle curved strongly upward and bearing in its convex posterior margin near the end two bristles. The ninth tergite is cut off squarely at the end and contains at the upper angle a few hairs.

The fore coxa has on its outer side about ten long bristles, three obliquely placed near its base, two obliquely placed near its apex and between these an irregular oblique row of five.

The hind coxa has a row of about six teeth on the inside. The middle and hind femora have no lateral bristles. On the posterior border of the hind tibia is a row of spines in pairs of five groups and on the sides are four pairs of bristles, each pair being obliquely placed. None of the apical bristles of the tibiae, or tarsi are as long as the next joint. On the anterior surface of all of the tarsi is a single row of bristles. The fifth tarsal joint of each leg has four pairs of lateral spines.

Length of tarsi, hind leg, 10-7-4-3-6; mid. leg, 5-5-3-2-6.

Length of female, 2.66 mm; length of male, 2 mm.

Color, pale brown.

A Dragon-fly Puzzle and its Solution.

By T. D. A. Cockerell.

In the summer of 1907, Mr. Geo. N. Rohwer found the hind wing of an Aeschnine dragon fly in the miocene shales of Florissant, Colorado. In the process of going over the material, I came upon half the specimen, the rock having split so as to divide the wing longitudinally. Having before me only the inferior part of the wing, and ignorant of the fact that the costal and stigmatic region had been preserved, I set out to determine the affinities of the fragment. It seemed a good opportunity to ascertain whether it was possible to settle the generic position from parts usually considered of minor importance.

I had very well preserved the ends of the radial sector and radial supplement, the ends of the third and fourth branches of the media, with accompanying supplement, and the ends of the branches of the cubitus. It appeared evident that the best characters were in the media and supplement, and attention was concentrated on these. At the very outset it was noticed that the medial supplement was very strong, only zigzagged at its very end, and its apical half was strongly curved. Taking the genera with a strong supplement, it was easy to construct a table in

Hind Wings.

One row of cells between supplement and M_4 . . . . [illegible]
More than one row of cells between supplement and M_4 [illegible]
1. Seven double cells between M_3 and M_4 . . **Planaeschna**, **Oligoaeschna** (**Dolaeschna**); also, but with two double cells (at apex) between supplement and M_4, **Telephlebia**.
Three or four double cells between M_3 and M_4.
Ten cells on margin between Cu_1 and M_4 . . . . **Brachytron**.
Fourteen cells on margin between Cu_1 and M_4 . . **Nasiaeschna**.
At most one double cell between M_3 and M_4 (head not known) **Lithaeschna**, but the region partly obliterated).
Two strong veins running from supplement to margin.
Perithemis [illegible]
No strong veins running from supplement to margin
Gomphaeschna.
2. Supplement bent so that a point near middle is nearer the [illegible] than a point beyond . . . . **Anax**, **Hemianax**.
Supplement not thus bent . . . .
3. Not more than two rows of cells between M_4 and supplement
Boyeria, **Aeschnophlebia**.
More than two rows of cells between M_4 and supplement at [illegible] part of their course .
4. M_4 with a little bend or deflection not far from the end
This bend absent or barely suggested
Basiaeschna; see also **Aeschna juncea**.
5 Cells between M_2 and M_4 double from bend of M_4 on . **Hoplonaeschna**.
Cells between M_2 and M_4 double at bend but mostly [illegible] beyond .
6 Where supplement and M_4 are widest apart, six rows of [illegible]
Staurophlebia, **Amphiaeschna**
Where supplement and M_4 are widest apart not over [illegible] cells between **Gynacantha**, **Aeschna californica**

In this scheme, the fossil ran straight to *Basiaeschna*, with which it agreed well, except that the cells between Cu_1 and Cu_2 were somewhat different, and especially in the arrange ment of the cells below Cu_2 where two or three large pentagonal areas were marked out by stronger veins. On the whole, however, there did not seem to be any reason why the fossil should not go in *Basiaeschna,* and it could certainly not go in any of the other genera, unless it were *Aeschna* of the type of *Ae. juncea.*

At this point the other half of the wing was found, and it was seen at once that the radial sector was branched, throwing it decisively out of *Basiaeschna,* and into *Aeschna* or some very closely related genus. Further investigation showed that it was in fact the hind wing of *Aeschna solida* Scudder, based on a single anterior wing. Another front wing of *Ae. solida* was found by Mr. S. A. Rohwer in 1907 (Station 14, Florissant). I would not have recited the above merely to record the birth and early death of a mistaken idea; it is given because it seems to be really significant in relation to the evolution of these insects. Dr. Needham (Proc. U. S. Natl. Museum, xxvi. p. 735) writes that in *Aeschna* and its nearest allies:

"There is this added feature—the radial sector has become forked. It will be observed that the anterior branch of this fork is separated from vein M_2 by a single row of cells, and that in the same place in *Basiaeschna* there is a line of cross-veins tending to straighten out. The anterior branch of the fork is developed out of this line of cross-veins. In the Australian *Aeschna brevistyla* all stages of its completeness and incompleteness may be found in a series of specimens."

The study of other features of the wing shows that *Basiaeschna* has indeed much in common with *Aeschna,* so that they should doubtless stand together as the connecting links of the series with branched and unbranched radial sectors.

In *Aeschna* itself, however, we have two types of branching of the radial sector. In *Ae. juncea, Ae. constricta* and the fossil *Ae. solida,* the upper branch comes off from the lower quite abruptly, and has all the appearance of being but a branch. In *Ae. californica* and in *Coryphaeschna* the effect is reversed, and the upper branch actually appears to be the continuation of the main vein. According to the doubtless correct explanation of the origin of the branch cited above, the first group is the primitive one (at least as regards this character), the second being a later development. In this and some other points *Ae. californica* stands far from such species as *Ae. juncea*, and thereby nearer to, but not in, *Coryphaeschna*. It probably deserves subgeneric rank.

Aeschna solida Scudder.

Some of the more interesting characters of this species are here described:

(1). Stigma of hind wing comparatively short, bounding three cells below (in *Basiaeschna* it is much longer, and bounds 4½ cells).

(2.) Postnodal cross veins 15 (Scudder's figure) to 16 (our specimen) in front wing; 17 in hind. The number is less in modern *Æschna*, especially in *californica*.

(3.) Doubling of cells between M_1 and M_2 begins two cells below base of stigma. Almost exactly this condition is found in *Æ. constricta;* in *juncea* it begins under apical half of stigma, in *californica* and *Coryphaeschna* beyond stigma. Thus there is a reduction of the doubling in the supposed line of evolution. In *Basiaeschna* the doubling begins under anterior half of stigma.

(4.) The bend of M_2 is distinctly more gentle than in *Basiaeschna*. This agrees with *Æschna*. The highest point of the bend is distinctly before the stigma; in *Æ. constricta* it is a little further on, but nearly the same; in *Æ. juncea* it is under the stigma; in *californica* under apex of stigma

(5.) M_4 has a decided kink in anterior wing, but in posterior this is scarcely suggested. This practically agrees with the supposed primitive section of *Æschna*, but differs greatly from *Æ. californica*. In *Coryphaeschna* the disturbance has gone so far that M_4 looks as if it ran into M_3, whereas it is really widely deflected in the contrary direction

(6.) The branches of the cubitus in hind wing spread apically so that the single cells between them give way to double or treble cells forming an irregular network. In *Æ. constricta* and *juncea* there are no single cells between the cubiti; in *californica* all those between the apical halves of these veins are single; in *Coryphaeschna* there are no double cells, or only one or two. *Epiaeschna heros* agrees essentially with *Æ. solida*.

(7.) The large pentagonal areas below Cu_2 in hind wing are shown in the figure. There is a suggestion of something similar in *Æ. juncea.*

(8.) The forking of the radial sector occurs considerably anterior to the stigma, especially in the hind wing. This is like *Æ. constricta* and *californica,* not like *juncea.*

I am much indebted to Mr. E. B. Williamson for the loan of a number of photographs, which greatly facilitated the above comparisons. The recognition of the identity of *Dolaeschna* with *Oligoaeschna* is due to Dr. Calvert.

◆

Some Observations at Southern Pines, N. Carolina.

THREE MOUND BUILDERS.

By ABRAM HERBERT MANEE, A. M.

(Plates XX and XXI)

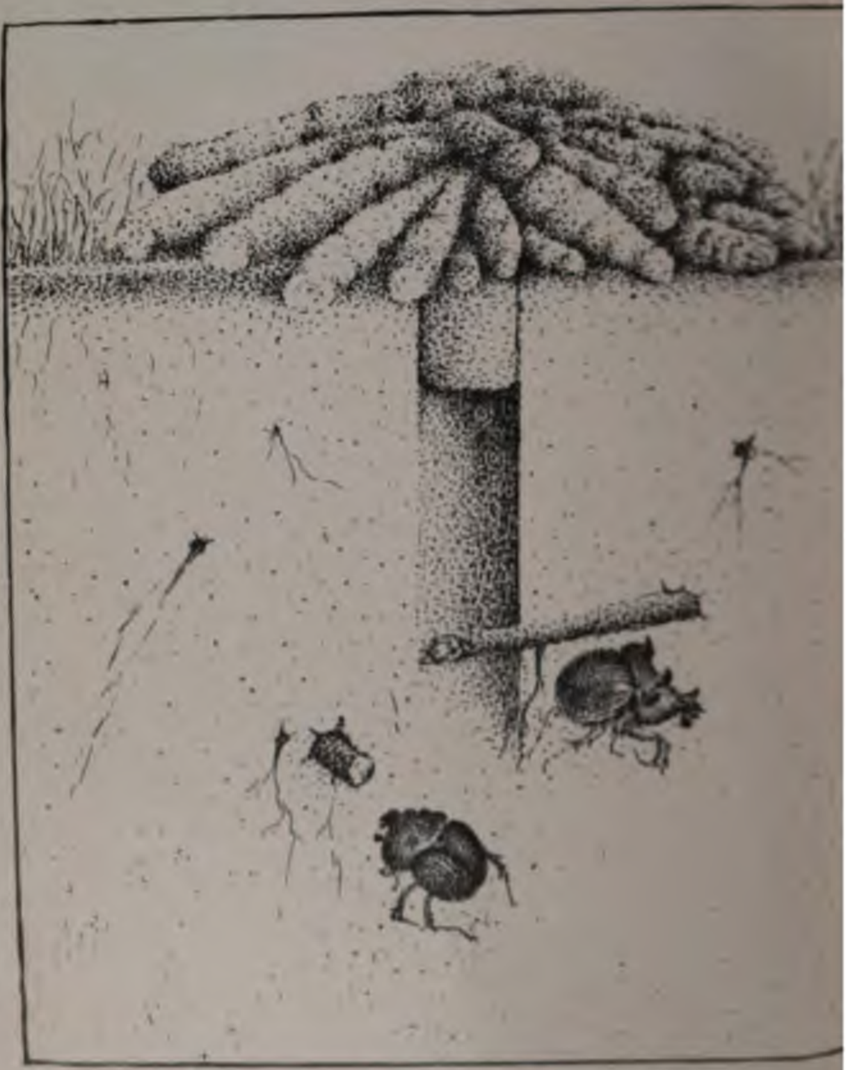
As reported to me by Mr. E. A. Schwarz through Dr. L. O. Howard, the genus *Bradycinetus* is confined to Central and North America, the only species in the Atlantic States is *ferrugineus;* nothing hitherto known of habits save that in Florida it is taken late at night as it is attracted to light; species rare.

In winter of 1904-5 I found a fragment of a male with thorax under a board. This was probably the first specimen taken in North Carolina. About 9 P. M., on June 5, 1905, two males came to our window as we were light hunting for moths. On July 16, 1906, our discovery of the haunts of *Strategus antaeus* suggested to my wife the probability of finding more of our species not yet identified and which I classed as a *Bolboceras.* Finding a four-inch mound in our yard, Mrs. Manee soon dug out a lively pair of *B. ferrugineus* and a few minutes later two other mounds each disclosed a pair, and that summer we unearthed over sixty specimens. During the three seasons of '06, '07 and '08 we have taken over 100 specimens, whereas had we not known the day haunts our entire find would have comprised not more than 4 specimens and those all males.

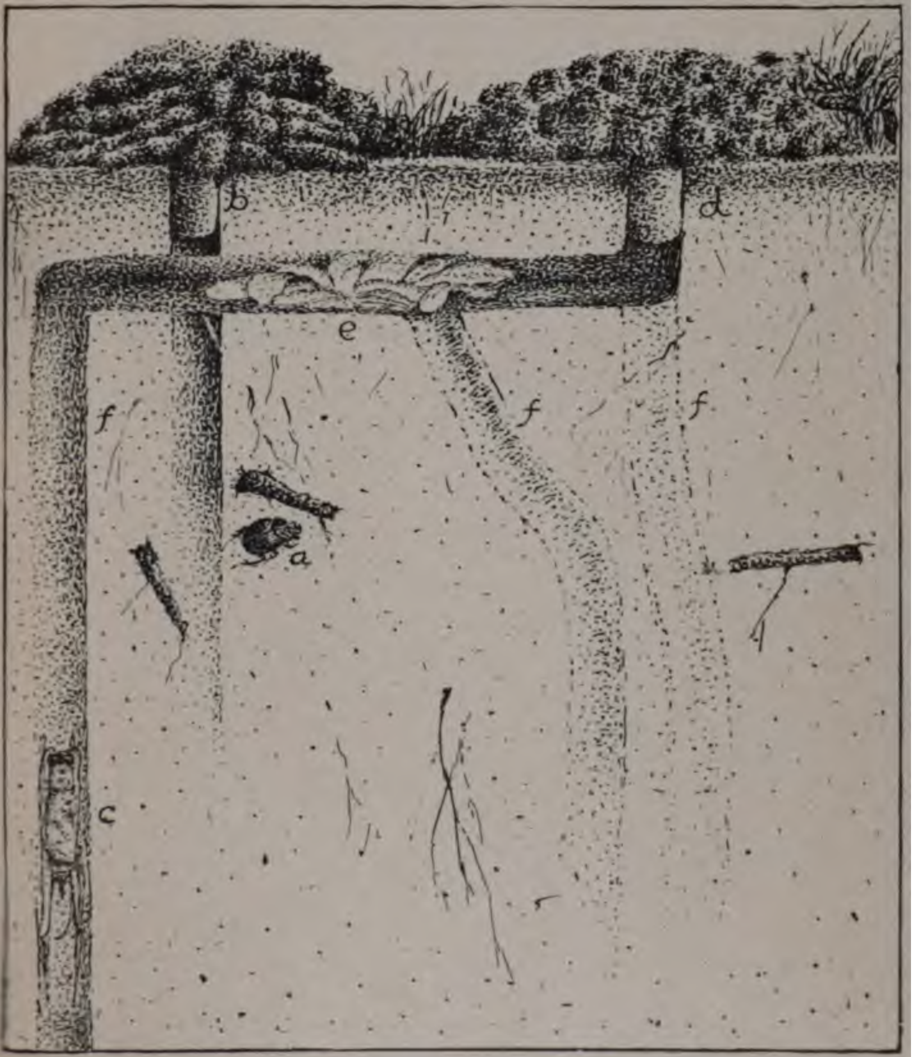
The beetles fly and evidently mate at night. I have observed a male moving about but a few inches above the earth as if scenting out its next day's habitat. Its goal is a small rotten or semi-decadent root of oak. With its fore-tibiae it digs a half-inch perpendicular shaft to a depth of from four to nine inches and in its work it is not *bradycinctus*, *slow-moving*, but very rapid. The excavated soil is pushed to the surface where it forms a mound two inches in median depth and four inches in diameter. This mound is like a pile of broken encrinite stems or "ropes of sand." When a pair are at work together the shaft is (as in illustration) packed with soil at the top to a depth of an inch. Usually when a male is working alone the shaft is open to the surface as if awaiting a female and reciprocally this is often so when the female is alone. I have never found two of the same sex under the same mound. The season for working is here from early June to late August, but from a hundred diggings I have seen no sign of a nest nor have I found even one egg. Moreover, I have examined many females freshly killed and have only one mass which I take to be an egg. It is white, globular and one-sixteenth inch in diameter.

I have not seen any species of *Bradycinctus* except *ferrugineus*. I have not seen any species of *Bolboceras* except *lazarus*. Yet I feel sure that these two species should be placed in the same genus and the generic name be *Bolboceras* as the *antennae* of *ferrugineus* are as truly *bulb-shaped* as those of *lazarus* and they are not *Bradycinctus* or *slow-moving*. The two species are more nearly alike except as to size than *splendens* and *antaeus* the two species of *Strategus* which occur here. Moreover, *Bolboceras lazarus* builds a mound and shaft precisely like *ferrugineus* except that they are proportionately smaller, the mound two inches in diameter of stems or ropes of soil and the shaft a quarter inch.

B. lazarus is reported to me as: Common in both Hemispheres; a scavenger; nothing known of habits except that it has been found under decadent leaves. My illustration will disclose what little I have learned of this species. It may guide observers in other localities to a larger knowledge. Though it must propagate in decadent matter it cannot truly



MANEE ON BRADYCINETUS FERRUGINEUS.



MANEE ON BOLBOCERAS AND ANUROGRYLLUS.

a. *Bolboceras lazarus.* b. Mound and shaft of *lazarus.* c. *Anurogryllus muticus.*
d. Mound and shaft of *muticus.* e. Horizontal chamber of *muticus.*
f. Retreat shafts of *muticus.*

be called a scavenger, as it does not convey its larval food from the surface, but, like *ferrugineus* and the species of *Strategus* and *Dynastes,* it seeks under-ground debris which is not polluting the air. Indeed, *S. antaeus* buries dead leaves and *D. tityus* revels amid over-ripe and rotting fruit in the orchards. These are more nearly scavengers though not so like in form of wing-case to the Geotrupes.

Anurogryllus muticus. I mention this cricket because its mound, very common here, so nearly resembles the mound of *B. lazarus.* The latter is formed of stems, the former of crumbs, but they are alike in size and shape. *A. muticus builds* near some small weed whose leaves furnish the wide but shallow horizontal chamber, and the shaft where the insect lodges may extend in any one of the three positions indicated in our illustration.

On April 16th, in a sandy road we found several mounds almost exactly like those of A. *muticus.* At the base of the vertical quarter inch shaft from eight to ten inches deep we took in each case one or two specimens of the Carabid beetle, *Geopinus incrassatus.*

Since my paper in the June *News,* I obtained a new date record for *Strategus antaeus* having dug out a female, June 15, or five weeks earlier than my previous first record. However, this has been throughout a much earlier season than usual. I am also on the track of *S. splendens.* I find that it comes out for a promenade just after nightfall, walking slowly over paths where its polish may reflect the lantern rays. Its neighborhoods are rare and far apart, but where one is found are traces of others. It is *bradycinctus* or slow-moving and thus is seldom found perfect or entire. The voracious ants eagerly disintegrate and mutilate any beetle alive or dead they may master or meet. I took a *splendens* at near noon tumbling about the grass as if blind, but as it was minus one antenna I conjectured that its unusual diurnal wandering was due to its one-sided sense of smell and sound. The brooding haunt of *splendens* is still in part a mystery, but from certain hints from local diggings, I am more than guessing that it does not make a mound or shaft, or nested chamber as does *antaeus*, but burrows horizontally beneath dead oak roots somewhat as does *Dynastes tityrus*, but not so deeply. Its life course as imago is from January 1, to July 1. At least these dates are the extremes of my record.

P. S. The male of the *Bradycinctus ferrugineus* has a profile resembling a pig. It should have been called *porcus*.

How a Hungry Flea Feeds.

By M. B. Mitzman, B. S., Entomological Laboratory, University of California.

A male squirrel flea (*Ceratophyllus acutus*) was starved for five days and then permitted to roam at will on the back of the writer's hand. He took four strides and settled on a ha[illegible] space, and taking firm hold, ceased abruptly in his locomotion, projected his proboscis and commenced to clear for action. A space was drilled by the picking epipharynx and the saw-toothed mandibles supplemented the movement by lacerating the cavity formed. The two organs worked alternately, the middle piece boring and the two lateral elements executing a sawing movement. The mandibles, owing to their basal attachment, are "capable of independent action, sliding up and down, but maintaining their relative position and preserving the lumen of the aspiratory channel." The labium doubled back, the V-shaped groove of this organ guiding the mandibles on each side as an arrow from a bow.

The action of the proboscis was executed with a [illegible] movement of the head and a lateral and downward [illegible] the entire body. As the mouth parts were sharply [illegible] the abdomen raised simultaneously. The hind and middle legs were elevated like oars resting above the surface of water. The forelegs were doubled under the thorax, the tibia [illegible] resting firmly on the skin and serving as a support for the body during feeding. The maxillary palpi were [illegible] sharply beneath the head and thorax.

The labium continued to bend at first acting as a sheath [illegible] the sawing mandibles and as these were more deeply inserted it bent beneath the head with the elasticity of a bow, forcing the mandibles into the wound until the obtuse maxillae were embedded in the epidermis. When the proboscis was fully inserted the abdomen ceased for a time its lateral swinging.

An acute pain was felt when the mandibles had half way penetrated and subsequently during each distinct movement of the abdomen. The swinging of the body continued at intervals of one to three minutes during the first fifteen minutes. In the next twenty minutes the lateral movement ensued every eight minutes and toward the end of the process the abdomen moved once very slightly. After the first twenty minutes the sting of the biting was not discernible; indeed, after the first sensation of pricking the pain became duller. This was experienced quite distinctly four times during the process. The only intimation received that the parasite was pursuing its bloody quest toward the end of the experiment was a feeble downward thrust of the springy bow-like labium accompanied by the feebler oscillations of the elevated abdomen, through the translucent walls of which could be discerned a peristaltic flow of blood, caudally from the pharynx.

During the prehensile function the antepygidial bristles waved once quite perceptibly, and the mid-tarsi maintained a constant rhythmic aerial vibration. At the end of fifty-nine minutes the victim tired of maintaining the hand in one position, and changed the attitude too abruptly, jarring the industrious flea, which quickly withdrew its proboscis by lowering the abdomen and legs and shaking the head laterally.

Prior to being bottled this untiring guest appeared much perturbed at the interference with its sanguinary feast. It wandered about seeking for another inviting spot—an oasis for its five day thirst.

* * *

A Cockroach New to the United States.—Among some undetermined material from Arizona in the collection of the National Museum has turned up an adult female of *Stelcopyga rhombifolia* Stoll. This constitutes a new record for our fauna. The specimen was taken by Mr. E. J. Oslar, at Nogales, Arizona, in 1905, June 14.—A. N. Caudell.

Notes on the Egg and Larva of Goniops chrysocoma (O. S.).

By W. R. Walton, Harrisburg, Penna.

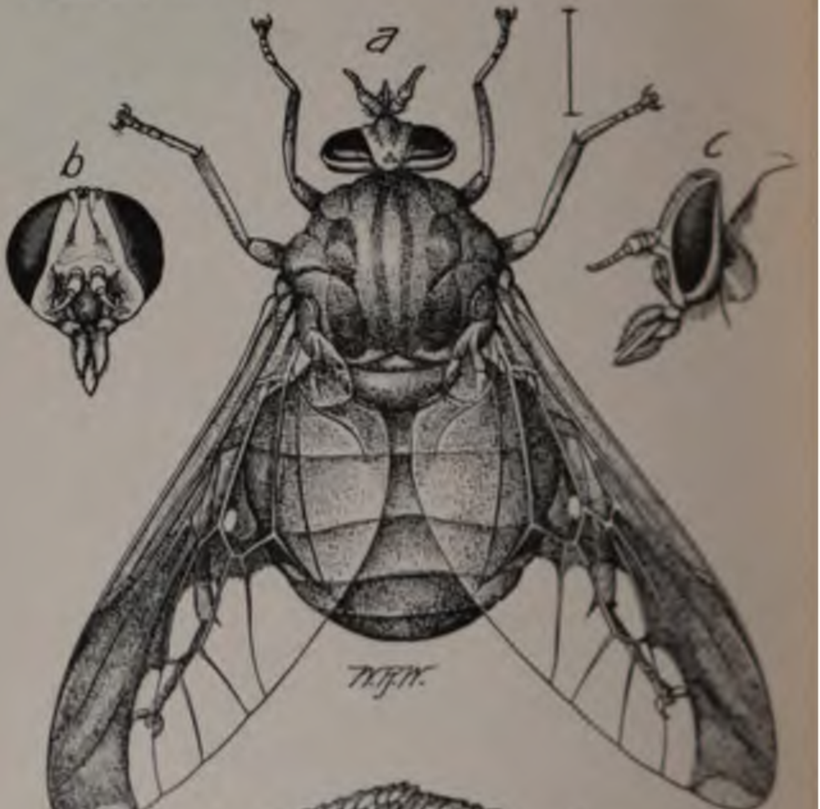
(Plate XXII)

The first fly of this species seen by me was presented by Mr. Warren S. Fisher, of Highspire, Pa., who took a female in the act of ovipositing on a leaf of what proved to be [illegible] sp? on July 4, 1907, near the above mentioned place. [illegible] overhung a small, more or less permanent ditch of water and we naturally inferred that the larva might be aquatic in habit in common with others of the family.

However, during the present year on the 14th of June while collecting on a dry hillside, in a brush patch, some five miles to the eastward of the former locality, I was attracted to a small oak sapling by a peculiar buzzing sound. After several minutes of stalking and intent observation, a female of [illegible] *chrysocoma* was discovered in the act of ovipositing on the under side of one of the leaves. She made no effort to escape; indeed it required considerable force to remove the insect from her position near the eggs. The immediate locality was a [illegible] side pasture lot, half covered with scrub oak and berry [illegible] dotted here and there with clumps of false indigo. [illegible] est water was a small overgrown ditch some 60 feet distant.

On the 18th of the same month I visited the spot near High-spire mentioned above, in hope of securing additional [illegible] was rewarded by finding another fly in a similar position [illegible] leaf of the wild cherry, some thirty feet distant from [illegible] water.

The two batches of eggs were placed in breeding [illegible] on the evening of July 25th the first larvae made their appearance. The second lot appeared two days later. [illegible] are yellowish-white when deposited and change [illegible] in color before hatching. The larvae are quite [illegible] hatched and it was a curious sight to see them [illegible] out of the eggs by dozens when the cluster was brought [illegible] the bright light.



GONIOPS CHRYSOCOMA (O. S.)—WALTON

The larvae I divided into three lots, the first was placed in earth entirely submerged in water, the second in dampened sand without food of any kind, the third in a jar of damp earth together with some small angle worms.

Twelve hours later the first lot were all dead, both of the other groups were lively and apparently in good condition, the second group continued to live without food for about ten days and then died. The remaining group lived for some weeks but finally died also, the angle worms being alive and uninjured.

From which I conclude, that in all probability the larva is terrestrial and the period of incubation is from seven to ten days.

Prof. J. S. Hine kindly determined the fly for me. The eggs, which are deposited upon the under surfaces of the leaves of various herbaceous plants and trees, in a three-sided pyramidal heap, are yellowish-white in color, about 1.5 mm. in length, slender, slightly curved and resemble those of many other flies in general appearance. One of the heaps contained 534 eggs by actual count.

The freshly hatched larva is slightly more than 2 mm. in length, slender but capable of contracting its body into an almost spherical mass; in color it is pale yellowish-white, semi-translucent. The head, which is capable of being entirely withdrawn into the first thoracic segment, bears several pairs of antenna-like appendages and an obtusely pointed chitinous hook.

On each side of the median line of the body, within the second thoracic segment, there is a distinct pinkish spot, also on the last segment there is a pair of round black spots resembling stigmata; elsewhere the body seems to be absolutely devoid of hairs or tubercles.

EXPLANATION OF PLATE XXII.

a Dorsal view of female.
b Front view of head.
c Lateral view of same.
d Top view of egg cluster.
e Dorsal view of young larva.
f Dorsal view of 1st thoracic segment, head nearly concealed.
g Lateral view of head and mouth parts.

A new Bee from Tahiti.

By T. D. A. Cockerell.

When Mr. R. W. Doane wrote that he was starting for Tahiti, I begged him to look out for bees; as, to the best of my knowledge, not a single species had been recorded from that locality*. He has brought home two species; the larger, respresented by three females, proves to be *Lithurgus atratiformis*, Ckll., the smaller is a new *Megachile*. All were collected in August, 1908. *L. atratiformis* has hitherto been known only from the warmer parts of Australia; the specimens from Tahiti are about 1 mm. smaller than the type, but otherwise identical.

Megachile doanei n. sp.

♂ Length, about 10 mm., with a large head and short abdomen; general appearance almost exactly like that of the S. African *M. [illegible]* Friese, though the abdomen is shorter. Black, without any red color except that due to pubescence; head large; eyes dark purplish; antennae long and slender, entirely black, not expanded at apex; mandibles tridentate, and with the usual basal inferior tooth; face densely covered with long creamy-white hair, tinged with ochreous above the level of the upper part of the clypeus, and from this level upwards black along orbital margins; vertex dull and very densely punctured, with pale yellowish hair, except about ocelli, where it is black; thorax with yellowish-white hair, but it is pale ochreous on scutellum, and black on disc of mesothorax and middle of pleura; mesothorax and pleura dull and very densely and minutely punctured; tegulae black; wings strongly dusky, the nervures and stigma black; legs black, hair on femora pale, on tibiae black or almost, on hind tarsi black on outer and copper red on inner side, on middle tarsi copper red on [illegible] sides, except a little pale yellowish at base beneath; anterior tarsi a little flattened and broadened (basitarsus not much over twice as long as broad), with a strong yellowish white fringe of hair [illegible] at apex; abdomen broad and short, rather shining, the first segment with long pale ochreous hair, and indications of a red apical [illegible]; third to fourth each with narrow orange red apical hair bands; [illegible] covered with orange red hair, except at extreme base of middle; [illegible] with orange red hair at sides and paler in the middle; apex [illegible] segment produced into two widely separated prominent lobes, the interval between them strongly concave; seventh segment [illegible] teeth or spines.

Tahiti, Aug., 1908, 2 males. (*R. W. Doane*).

This species is related to several which inhabit Australia. It also appears to be close to *M. diligens* Smith, from Honolulu, differing in the black hair on the thorax, and other particulars.

---

* I find however one record of a bee from Tahiti, *Lithurgus [illegible]* [illegible], Reise der Novara, 1867. This species is also known from Samoa.

Popular Fallacies Regarding Insects; and some Insects that are Poisonous.

By W. R. Walton, Harrisburg, Pa.

In the paper which I shall present for your consideration this evening there is included at least one organism that is entirely without the pale of entomology. I refer to the hair worm, but as the economic entomologist is often called upon to answer questions regarding this and other forms not included in the class Insecta we think it quite proper that some of them be mentioned in the present paper.

When the speaker was a boy some ten years of age, his family moved from a large city in the middle west, to a farm in the southeastern corner of New York State.

He had never been in the country before and the book of nature now opened to him for the first time became a source of wonder and delight. But this delight was not unmixed with dread because of the tales which were told, of this insect or that reptile, whose bite was instant death, or whose diabolical ingenuity enabled it to sew up one's ears or perform other unheard of and monstrous deeds of aggression. And from the fact that many of these wonderful stories, emanated from persons in whom he had the utmost confidence, they became part of his boyish faith for a time. But as months passed on and neither he nor his companions were attacked by the beings of whom the terrible tales were told, he began to doubt and (being nothing if not curious), at last to experiment with them. The results of the experiments tended to upset all of his lately acquired lore, but this gave him great prestige in the eyes of his companions, who, still believing in the old yarns, looked on with awe as he juggled garter snakes, or wooden horses (Phasmidae), or held devil's darning needles by their wings while they champed their jaws in fury and curled their venomous tails in fruitless efforts to sew up his fingers.

One of the most wonderful of the tales current among the country folk of that region and one which I believe to be very widespread, was the fable of the "Hoss Hair Snake" We often came upon the snakes, as they were called, in little puddles of water left by the rain or in watering troughs and sometimes in spring houses. We were told that they were originally hairs from the mane or tail of the horse, and some persons declared that these wriggling creatures were also produced from human hair. The bite of the hair snake was said to be very dangerous to man and was likely to cause the loss of the member bitten. One species of hair worm which is white in color, and is sometimes found in cabbage heads is reputed by the country people to be very poisonous. Prof. Surface has been called upon a number of times to refute this fallacy which seems to be a common one in some parts of Pennsylvania. An excellent article on this species is Mr. F. H. Chittenden's treatise published as Circular No. [illegible] of the U. S. Bureau of Entomology. I shall not forget my first attempt to rear a hair snake. Taking a long horse hair I placed it in a pail of spring water and set the same in the sun as per directions, where it was to remain for seven days, no more, no less; visiting it daily, my hopes gradually sank until the seventh day, when I took it out, examined it, and as limp and wet, never a wriggle or squirm could I get it [illegible] it was still a horse hair and nothing more.

When I related my experience to the initiated, the [illegible] informed me that "O' course ye can't make no hoss hair snake out of a hair that hain't got no roots on it, what ye wanter do is to pull one out by the roots and put it in the water right off, then ye'll git a hoss hair snake sure." Alas for the credulity and the credibility of man! I was again doomed to disappointment, for on the sixth day there was no change in the hair and on the morning of the seventh day, when I looked, behold some thirsty creature had drunk [illegible] fourth of the water including the hair. And it was some years later that I first read of the natural history of the hair worm or Gordius.

Dr. Jos. Leidy of Philadelphia, published in the *Entomologist and Botanist*, 1870, Vol. III, No. 7, a partial life history of this nematode, by which it was shown that the larger portion of its life is passed within the body of some insect in a similar manner to the "Guinea worm" and other round worms in man and the lower vertebrates.

Every spider, and especially the "black spider," was considered as a deadly poisonous creature. The only exception to the rule that I can recollect was the "daddy long legs" or harvest man, which no one seemed to fear, and which the boys used to dismember (young savages that we were) to see the legs kick after they were severed. However, there is no denying the fact that some few species of spiders are capable of inflicting dangerous bites. This was brought out in *Insect Life* some years ago when an exhaustive discussion of the subject, almost world wide in its scope, was carried on. It was shown beyond cavil that spiders of the genus *Lathrodectes* had caused the death of human beings in a number of instances. Especially in New Zealand, where the Katipo, a member of this group, is greatly feared and justly so, because its bite is known to have caused serious results in a number of cases.

There is a species occurring on the Atlantic sea board as far north as North Carolina, which is reported in a number of apparently well authenticated cases, as having produced intense suffering and even death, by its bite. We find a good account of this in *Insect Life*, Vol. I, No. 7, Page 204, where an illustration of the species is supplied. Notwithstanding the fact that the late Dr. Marx of Washington, secured entirely negative results from his experiments with the poison of this creature when applied to the bodies of the smaller mammals, it behooves us to observe the utmost circumspection in handling black spiders having red and yellow spots on their abdomens. The members of the genus *Lathrodectes* are so marked and regarded with dread by both savage and civilized man alike throughout the world, wherever they occur. The same story is told by all. "It bites and its bite is painful and dangerous."

Going on up the scale of invertebrate life, the next form that

I remember as terrorizing the exemplars of the simple life, was the "devil's darning needle," "snake feeder or snake doctor," as it is called hereabouts. We are all familiar with the story that this singular insect is capable of sewing one's ears up, for what purpose has never been divulged, which leaves us to assume that it was for "pure deviltry." Of course, no credence is placed in this absurd story at the present day by "grown ups," but the children in some parts of the country still cling to the fallacy.

One of the peculiar local myths with which we were familiar in boyhood, was that of the wooden horse, a local name for the walking stick insects. Its bite was said to be peculiarly fatal, one could not expect to live long enough to murmur even a short prayer if bitten by one of these creatures; you simply turned up your toes and died instanter. It is inconceivable that this sluggish, fragile creature could ever harm a human being, as it is incapable of biting anything but leaves, which form its ordinary food.

Another fallacy more widespread and popular than the last is the one regarding the ability of the 17 year Cicada to inflict a poisonous bite. This fable will not down. In this respect it reminds us of the old line in our copy book, "Truth crushed to earth shall rise again." It is counterfeit, however, and there is not a particle of truth in the yarn. There existed for some years a spirited discussion among entomologists, as to whether or not the cicada ever made any use whatever of its formidable beak, but the question was at last settled by Prof. Quaintance of Washington, who discovered a cicada in the act of feeding, with its beak in the sap wood of a tree. He killed it in situ and making a section thereof, proved with the help of a microscope, the facts above mentioned.

It seems strange to me that in spite of the tendency of the people at large to attribute poisonous qualities to harmless insects, of many kinds, there should exist in considerable numbers in practically all parts of the country, insects that are capable of inflicting painful bites, but of which one seldom hears except through scientific publications. I refer especially to the Hemiptera Heteroptera, the true bugs. The speaker has had personal experience of a painful nature with at least two species of these insects; the first of which was a pair of Notonectidae, or back swimming bugs. Having scooped up a pair of them in the hollow of my hand, on attempting to grasp them, one of the insects inserted its beak into the ball of my thumb. There was an immediate burning pain in the member, which began quickly to swell; this pain and swelling extending to the elbow in a short time. The soreness remained for several days and was much more severe than the result of any bee sting I ever received. The other insect was a species of assassin bug (family Reduviidae), which bit me between the fingers and caused swelling and pain to no mean extent. There are many other species which are known to inflict painful and sometimes dangerous bites; among which may be mentioned *Conorhinus sanguisuga,* sometimes known as the big bed bug. It is a southern species and is quite troublesome at times. Also, *Rasahus biguttatus,* a western species, said to inflict a severe wound, and two species which abound in Pennsylvania are *Melanolestes picipes* and *Opsecoetus personatus.* In fact all the bugs of the family Reduviidae should be handled with the utmost care. There is no doubt in the mind of the speaker, that the giant water bugs, *Belostoma americana* and *Benacus griseus,* are capable of inflicting severe bites, as they are known to be able to kill small fish almost instantly by means of the beak. However, we must admit that no report of their having bitten any one has come to our notice.

Many of us will no doubt recollect the kissing bug scare which swept over the country some few years back; of the insects reported as having done the kissing, fully 75 per cent. were true bugs which belonged to the family spoken of above.

Another famous hoax of childhood was the "ear wig"; this affectionate insect, which by the way carries a pair of forceps at the end of its tail, was supposed to crawl into the ear of a sleeping person where it remained to torture him till "kingdom come." Of course, the story is a myth, although insects do occasionally enter people's ears accidentally and are a source of intense pain and annoyance until removed. As a matter of fact, the ear wig appears to be rather an uncommon insect in collections and is seldom seen in nature. The forceps are used in arranging the true wings in folding them upon the back, the insects being harmless to the last degree. What were usually pointed out to me as ear wigs were several kinds of centipedes or millipedes. Some of the larger of these centipedes can and do bite severely when roughly handled. The house centipede or skein centipede, a really beneficial creature which feeds largely on roaches, should never be grasped with the bare hand as it is capable of inflicting a wound.

We still retain a vivid recollection of an occasion upon which there had been a wholesale sacking of bumble bees nests and the slain bees strewed the ground in considerable numbers. Upon picking up one of the dead bees for a good look, we were very much pained and grieved because the headless corpse stung us on the finger quite badly. She was dead, but it had not occurred to her as yet.

We cannot pass the Diptera by without saying a word regarding the mosquitoes. It is only a few years since the mosquito was regarded as merely a troublesome insect [illegible]ing but not to be regarded in any way as dangerous. [illegible] thanks to Economic Entomology, the mosquito is known to be the transmitter, if not the source of yellow fever, [illegible] and elephantiasis; three very serious diseases, all of which [illegible] on the wane in civilized countries, because of rational treatment made possible by the sacrifices of heroic scientific investigators. When the relation of the common house fly to [illegible] shall have been fully studied we expect revelations more astounding than the facts mentioned above. There is an old expression and I believe it is a verp ancient one, "As hard [illegible] as a fly." Go back for a few hundred years to the time when the first rays of the light of modern hygiene had not as yet penetrated the inky gloom of ignorance. During the early part of the 17th century, in the immense city of London, before the coming of the "Great Plague," and the fire that followed it, sanitary sewers were unknown, the gutters [illegible] of every conceivable kind, and it necessarily follows that flies bred by millions; they swarmed everywhere. Window screens were unknown or only within the reach of the rich. We need not wonder that 68,000 men, women and children paid the death penalty for the frightful conditions which must have prevailed at that time. But we have before us an example more recent than the one just mentioned in testimony against the fly. I refer to the frightful rate of mortality which prevailed among our soldiers at Chickamauga. There is not the least doubt now in the minds of persons who have studied the question, that the terrible typhoid scourge which occurred there, is directly traceable to flies, these insects flying from the open latrans or closets, to alight upon the very food which was being eaten by the men at mess. It is revolting to think upon, but it is nevertheless true.

And we are convinced that if the effects of the house fly and its near relations upon the destiny of man, could be shown at a glance to the people at large, the world would stand appalled by the vision and the elimination of the house fly would follow as a matter of course.

Additional Notes on the Life History of Culex perturbans.

By John A. Grossbeck.

(Plate XXIII)

In the January number of this journal, page 22, the discovery of the larva of *Culex perturbans* in nature is reported by Professor J. B. Smith and in the report of the New Jersey Experiment Station for 1907 the life history as far as then known is given by the present writer in some detail. The method of egg laying and the habits of the larva were worked out, but on account of the hibernation of the latter the pupa remained unknown. It was with some interest therefore that the approach of spring was awaited and early in March the first *perturbans* hunt was made at Trenton, N. J.,—not for the purpose of securing pupæ but to gather in a host of larvae that pupation might be observed in the laboratory and the duration of the pupal period thus determined.

Over a hundred larvae were soon under observation, but separated from their vegetable attachments they showed an evident disposition to rise to the surface, there to become sluggish and finally die. Single strands of roots or even small bits of sod taken from the swamp were ignored by the larvae and we ultimately found that if we would bring any to maturity we must secure for them conditions as nearly natural as possible. Accordingly an entire grass tussock was brought from the swamp and, with a new supply of larvae, was placed in a large battery jar. Soon the larvae disappeared, all of them having worked their way in among the roots of the tussock. From day to day this jar was watched but no pupae were observed until on May 20th two dead male adults still attached by the feet to the pupal skins were on the water's surface. The sod was now removed from the jar for examination and four living and two dead larvae were taken from the vegetable mass, also two living and one dead pupa. The two living pupae were transferred to clean water and unlike other *Culex* pupae immediately sank to the bottom and aside from an occasional flap of the anal paddles showed no signs of life. At the bottom they rested with the abdomen curved under the thorax, the paddles closely appressed to the "face" (upon which it rests) and were most generally tilted to one side, though occasionally they assumed an erect position. For three days the pupae remained in this death like attitude and were then placed in alcohol, supposedly dead.

In general build and appearance the pupa of *C. perturbans* resembles the normal *Culex* type but a strikingly characteristic feature is found in the long, slender air tubes which converge apically and finally meet at a common apex. In color it is light brownish with the head and thorax, except those parts including the metanotum and eyes, soiled whitish. The length of the thorax is about 2.5 mm. and including the extended abdomen, which is unusually long, about 7 mm. The air tubes measure 1 mm. in length or slightly over, are strongly [illegible] fuscated and finely ringed for over two-thirds their length from the base and are suddenly constricted toward the tip, conforming in this respect with the air tube of the larva and evidently for a similar purpose. The entire pupa is destitute of external vestiture except for two small hairs situated near the base of the second abdominal segment. The anal paddles are long about four times as long as broad, and have finely serrated margins.

On June 2d the first pupa was collected in the Trenton swamp and on the 5th two others were taken. They were washed from the bottom mud and vegetable debris and like those in the laboratory showed scarcely any signs of life. They gradually died without producing adults. By this time the water in that portion of the swamp which supplied us with larvae was so completely run off in consequence of drainage operations that further observations in this place were precluded. Mr. J. T. Brakeley, of Lahaway, however, was able to continue his studies throughout the season, getting his material from the pool in which eggs were first discovered in 1907. These notes now in the hands of Professor Smith will be collated and published in the Report of the New Jersey Experiment Station for 1908.

Mr. Brakeley collected the first pupa on May 28th and on the 31st of that month three others were taken. From these he secured three male adults on the 1st and 2d of June, his pupae having been apparently more advanced than those collected by myself and therefore maturing in spite of unnatural conditions. Additional pupae were collected at intervals throughout June and July, some producing imagoes, others failing to do so.

From what has been observed it is certain that the pupae never come to the surface for air as do the other forms of *Culex* (sens. lat.) of which the early stages are known. It is almost equally certain that the air tubes used in unity are inserted into the grass roots and like the larva oxygen is secured through the tissues of the plant. That these tubes are not permanently fixed in one position is shown by the fact that they separate when immersed in alcohol, and that they can be independently moved at the will of the pupa has been demonstrated by Mr. Brakeley who has observed them with one tube projected through the surface film of the water and with the other propelling itself in a rotating movement around the first which served as a pivot.

An interesting fact in connection with the larva was also demonstrated by Mr. Brakeley when on July 31st he obtained a small lot of young wrigglers apparently in the second stage of development together with a full grown larva which clearly belonged to last year's brood. Thus is the record established of the continuous prevalence of larvae throughout the entire year. This had been previously suspected because of the capture of newly emerged adults from May to September.

EXPLANATION OF PLATE XXIII.

Fig. 1. Pupa of *Culex perturbans*, lateral view

Fig. 2. Pupa of *Culex perturbans*, rear view, showing converg[illegible] air tubes.

Fig. 3. One of the air tubes highly magnified

Fig. 4. Swimming paddles of pupa.

◆

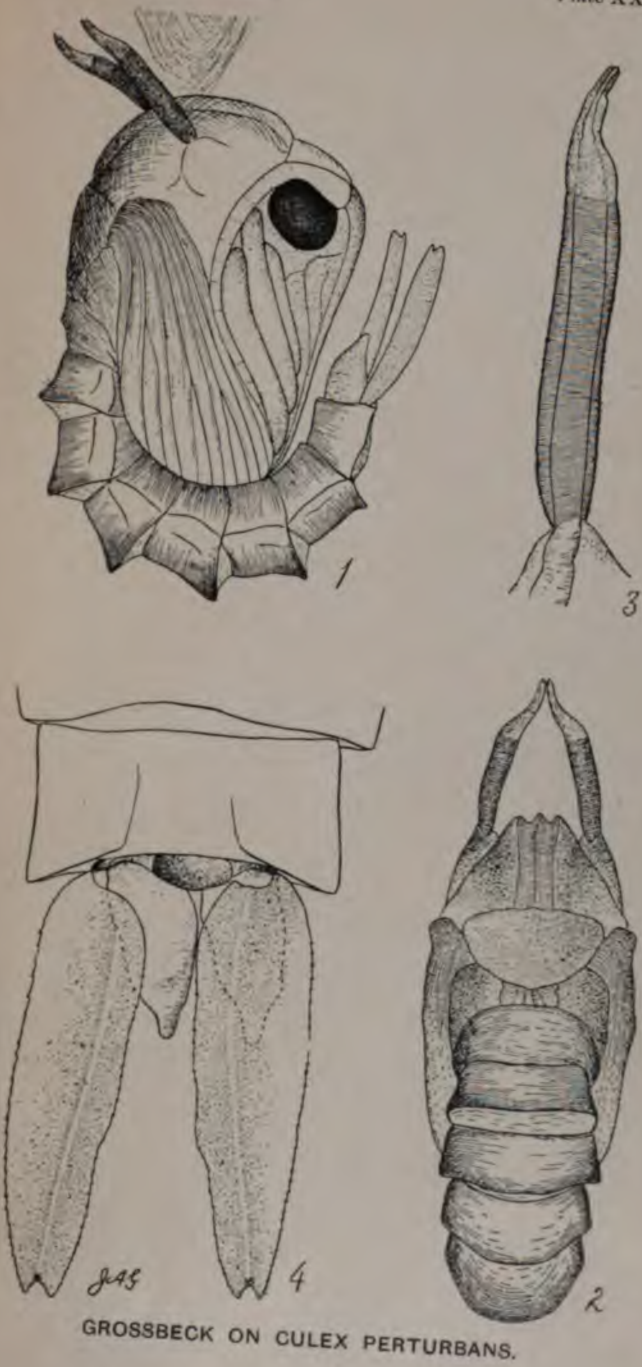
The Life-History of Lycaena antiacis Bdv., with other Notes on other Species.

By Francis X. Williams, San Francisco, Cal.

The fact that *antiacis* has exactly the same habitat a[illegible] and that there are immediate forms making [illegible] stones between the two would leave no doubt to my [illegible] they are one and the same species. However, being [illegible] of further satisfying myself on this point, I reared a [illegible] of larvae which, at different periods in 1908, proved [illegible] *antiacis*. I am still satisfied however that [illegible] *antiacis* being the other form, and that this [illegible] be dependent on weather conditions. A good series [illegible] two will show from the under surface of the wings [illegible] intermediate forms, but aberrations as well, whereas [illegible] from the upper surface the two insects are indistinguishable.

Xerces is easily recognized from the under side [illegible]

Plate XXIII.



GROSSBECK ON CULEX PERTURBANS.

by the large white unpupilled or scarce-pupilled spots. The underside may be light gray to dark stone color, usually darkest in the females; and the basal area and inner margin of the secondaries plentifully sprinkled with greenish scales, and clothed with long white hairs. There may be a white dash, plainest on the primaries from the discal arc to the base of the wings. Above in the male, the color is lilac blue, with usually a rather wide black border. The female is dusky, with blue scales about the base of the wings.

Antiacis (from San Francisco) is the same above as *xerces*. Below, the white spots form a wide margin to the black pupils, which may be quite small, especially on the secondaries, or quite large and more or less reniform on the primaries. The form *mertila* is *antiacis* with the white dash from the discal spot to the base, and with small black spots on the secondaries. The insect figured in Wright's "Butterflies of the West Coast" as *mertila* apparently lacks the white dash to the discal spot (a character of *mertila*), and is therefore not *mertila*, but *antiacis*. I have a female *xerces* in my collection with four of the seven white spots on the underside of the primaries unpupilled, and the pupils on the secondaries are almost obsolete. Several other specimens in my series show these white spots with their pupils becoming obsolete. A male *antiacis* which I possess has two indistinct, unpupilled white spots below on the right primary, none at all on the left one, and but four (pupilled) spots on each of the secondaries. It is very plain therefore that these "blues" are subject to much variation, and this has not been sufficiently considered.

Lycaena behrii, as described by Edwards, is typically represented in a "blue" frequenting the San Francisco Bay region, but is not found within the city and county of San Francisco. This insect is also lilac blue, but the lilac tint is not so strong as in *antiacis* and *xerces*. It differs also from these two in the form of the wings; in *behrii* they are more rounded, therefore blunter, and of greater breadth. The female *behrii* is duskier than that of *antiacis* and *xerces*, and has little if any blue at the base of the wings. On the underside the wings are "uniform dark brownish-gray" as described by Edwards, with the black spots more narrowly encircled with white and usually larger than in *antiacis*. The ground color underneath is usually much more uniform than in the latter, less plentifully sprinkled at the base of the wings with metallic scales, and not having the suffusion of white markings occurring both in *antiacis* and *xerces*. Like them however it is a spring butterfly flying in March and April, and sometimes even in February. It seems to me that *behrii* is a distinct species and not a variety of *antiacis*, for it can be readily distinguished from the latter in the adult and larval state, and also by its habitat. I have not taken *behrii* in northern central California, but a form quite distinct but closely allied to it. It flies a good ways [illegible] of San Francisco, but I have not taken it in Monterey county about a hundred miles south of the city where there is a [illegible] very close to if not identical with the southern *L. polyphemus* figured in Wright's book as *antiacis* but quite different from the latter.

Lycaena xerces is said by Boisduval to inhabit the Yuba Mountains ("Montagnes de la Juba"); this appears unlikely but cannot be discredited until that region is well explored entomologically in the proper season. It may fly [illegible] Marin Co., north of San Francisco. Both *antiacis* and [illegible] were formerly quite abundant in the Western Addition [illegible] city; and this is where most probably *xerces* now [illegible] come from. Here however it is nearly extinct, owing to the progress of civilization, but it is still present as a [illegible] colony in a limited area on the hills near the ocean, at the [illegible] boundary of the city and county of San Francisco. It [illegible] not on the sand dunes proper, but about sandy soil with [illegible] low and scant vegetation, where its food-plant *L*[illegible] grows. *Xerces* always flies with *antiacis*. The latter [illegible] a wide range, but as far as I can ascertain, it is not the [illegible] species of *antiacis* of other states or of other parts [illegible]. There remains much to be done in this group, as any [illegible] see who has a good series of these insects.

Lycaena antiacis.

[illegible] Of the usual echinoid form, depressed at the [illegible] in a pit. A raised white net work, the meshes quadrilateral, and [illegible] mounted at each angle by a short rounded process, somewhat obliterates the delicate pale green ground color. Diameter about .65 mm.

With few exceptions the egg is strongly glued to the dorsal surface of a leaf (rarely terminal) of *Lotus glaber,* a prostrate legume common in sandy soil. Though several eggs are sometimes found on one leaf, each was probably laid by a different female.

First instar.—The larva in escaping from the egg eats a large ragged hole out of the top, but consumes no more of the shell.

Head of moderate size, blackish, and retracted under the first segment; body in freshly hatched larvae of a pale yellowish green; oblong, and somewhat ridged, and covered with minute dark green granulations, and bearing smooth conical, brown tubercles which give rise to rough, translucent whitish hairs arranged as follows: A double row on each side of the median line, the inner hairs the longest, some three-fourths the width of the body; three infra-spiracular hairs on each segment, the middle one the longest; and a row of short clavate supra-stigmatal hairs. Cervical shield pale gray, with minute hairs. A sort of plate, possibly an osmaterium dorsad on the fused ultimate segments. Length at commencement of instar, 1.5 mm. Later in instar larva becomes darker, and the various bands are indicated.

Second instar.—Body plum color; median (heart) line of a darker plum, with a bordering band of dull lilac. Oblique latero-dorsal dash on segments, dull lilac, then below, two indistinct bands of the same color, and finally the dull lilac lateral band. Long hairs as in instar I, and in addition short whitish pile. Length at commencement of instar 3.5 mm. At the end of the instar the pattern becomes more distinct, and the larva assumes a dull green, or more rarely a dull gray color. The dull green larva has a dark green median band (brownish on seg. 2), with a yellow or yellowish-green bordering band. The oblique dashes and the two following bands are rather indefinite, and the pale lilac lateral band has a darker ventral border. The dull gray larva has darker markings. Cervical shield gray. Length at end of instar 5.3 mm.

Third instar.—All markings much plainer now. General appearance gray, median line purple, bordering band whitish yellow; oblique dashes lichen gray, the following sub-horizontal and horizontal bands of the same color; lateral band pale lilac with yellowish tinge, darker at its edges. Dorsal plate (?) on seg. 10, and a pair of whitish eversible spiny bulbs on seg. 11. Length at commencement of instar 6.75 mm. At end of instar the larva is of a delicate pale green (sometimes yellowish-green) color; median line dark green, bordering band yellowish-green, fading out at segment 10, the median line going beyond; oblique dashes (which proceed dorsad anteriorly and form an acute angle with the median line) pale green, and indistinct after seg. 10. The band following the oblique dashes is sub-horizontal, and the next horizontal. Both are pale green and indistinct. Lateral band pale creamy yellow. Head small; blackish; legs pale brown with a pale green band along their base. A well-marked dorsal ridge. Length 9 mm.

Fourth instar.—Length at commencement of instar about 9.3 mm. Piliferous tubercles whitish; some smaller dark tubercles present. At the end of the instar the body is pale green; median line dark green, broad bordering band yellowish-green, oblique dashes distinct, yellowish-green, the following sub-horizontal and horizontal bands of the same color but more obscure, the whitish spiracles running along the upper edge of the latter band. Lateral band yellowish white, ventral [illegible] ing indistinct pale lilac, present on all the segments, plainest from seg. 2-10, and of a pale green color around the last segments. A pale greenish-yellow band on four prolegs. A long transverse plate [illegible] on seg. 10, with some dark tubercles. Eversible sacs whitish. Long hairs on each side of dorsum, some laterad and others on the sub-lateral [illegible]. There are some small dark piliferous tubercles especially anteriorly, and the whole body is covered with a whitish pile. The larva is slug shaped, with the posterior portion flattened, the segmentation is distinct and the small black head usually deeply inserted into the apparently [illegible] zontal first segment. There is a distinct dorsal ridge, and some depressions along the sides of the body. Length 15 mm., width 4.75 mm. There is color variation here as in the preceding stages, the larvae are sometimes greenish yellow, while those reared in tin boxes are more brightly marked than those taken in the field (on which [illegible] descriptions are made), being of a more lilac tone.

Pupa.—Stout; venter nearly straight, dorsum rounded; [illegible] wing covers pale grayish green; abdomen pale wood brown [illegible] reticulate, median line appearing through cuticle as a [illegible] brown line, broad on the abdomen, narrow on the [illegible] it is nearly black, and wide again and dark on the [illegible] thorax, where it diffuses along its margin heavily [illegible] ventrally. A very fine greenish line runs through the [illegible] thorax. A latero-dorsal brownish black blotch on the [illegible] of the mesothorax, and just lateral of this a roughened [illegible]. Another dusky patch in the basal angle of the primary [illegible] a more compact one on the first abdominal segment in the angle [illegible] [illegible]. [illegible] most strongly marked specimens has the [illegible] emphasized by the dusky subdorsal to ventral reticulation [illegible] In paler pupae the dorsum is not well differentiated [illegible] of the abdomen. The edges of the abdomen are [illegible] [illegible] edged with black. Spiracles brownish [illegible] [illegible] brown areas. A smooth transverse [illegible] of the [illegible] abdominal segment. Head pale wood brown [illegible] antennae, maxillae and wing veins peppered or blotched with dusky. A few short hairs on stigmatal areas of segs. 6 and 7 of abdomen and on venter of the last two (fused) segments. Length 10 mm., width at seg. 3 of abdomen, 5 mm. Some pupae are quite pale, the general color being gray-green; others are quite heavily marked.

Antiacis larvae bred in tin boxes transformed to pupae about forty-eight days after hatching from the egg, or from early April to the end of May. Mature larvae obtained in the field did not pupate until the first part of June or even later. The younger larvae merely bite pits into the leaves, but older ones will devour the leaf entire. Though *Lotus glaber* is the usual food-plant of this "blue," I have found one larva of *antiacis* on *Lupinus arboreus,* and they will readily devour the leaves and pods of *Lupinus micranthus* and *Astragalus menziesii.*

Several days before pupation the larva loses its clear color and markings and assumes a dull sea-green shade, or more rarely becomes dull bluish-green, and semi-transparent in either case. It is now somewhat shortened, and choosing a convenient surface, spins a mat of silk where it later girdles itself for pupation. The silken girdle is rather weak, and where it joins the mat on either side the several strands are commonly united into one thread, but usually break up into several near the dorsum of the insect, so that it is wide in that region. In the larva, this girdle, starting from the mat at about the second abdominal segment, proceeds anteriorly and dorsally so as to support the third thoracic segment. Three days after girdling it sheds its exuvium and becomes a pupa. The larger hairs of the larva dry up and lie appressed to its body, and the latter in assuming the shape of the pupa becomes somewhat constricted in its middle. The larval skin, tightly drawn over the thorax, is loose and wrinkled over the abdomen. It splits on the thorax as in other larvae and exposes the pallid pupa, which in time assumes its proper shade.

By the beginning of June, I had about twenty pupae from which I obtained sixteen butterflies, nine males and 7 females. They were all *antiacis,* though several had the white dash of *mertila.* With one exception they came out quite late as compared with *antiacis* in nature, emerging from the end of April to the 7th of July. The exception came out in midwinter. The pupae were kept most of the time in a warm dry room.

Three hymenopterous parasites were found preying upon the larva, and they all emerged the same season. One, presumably a braconid, spun a bright yellow cocoon but the adult escaped unobserved. But one larva parasitized each caterpillar, as was the case with the other two species. A single specimen of an ichneumon was reared from a pupa, but the commonest of the three parasites pupated within its host, when the latter was at the end of the third instar. Before pupating, the parasite in the now dead and elongate larva securely fastens the latter to some object by piercing the exuvium below the head and cementing it through this aperture with some secretion. But the perfect insect makes its escape not through the anterior portion of the skin, but through a hole in the dorsum of the posterior end. Fig. 1 represents a larva of *L. antiacis* two days prior to pupation; Fig. 2 dorsal view of a pupa of the same.

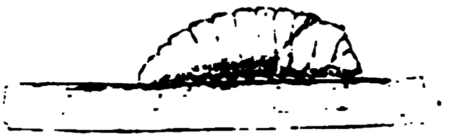
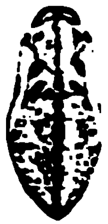


Fig. 1.



2

Lycaena behrii.

Mature larva. Head black, body very pale coffee col[illegible] below the spiracles, median line reddish brown, with a [illegible]. Pattern similar to that of *antiacis*, the oblique dashes [illegible] subdorsal and horizontal bands more obscure, all these [illegible] ble [illegible]. Lateral line white, purplish [illegible]. [illegible] roughened [illegible] on body longest dorsal and later[illegible] shade on seg. 1. Shield grayish green. Length 13 mm. [illegible] 7.-7 mm. Another mature larva of this species is darker than the preceding and is pale greenish subdorsally [illegible] blotch spotted with a greenish tinge, broadest and [illegible] seg. 2 and [illegible] on seg. 1, where its course is indicated [illegible] pubescence [illegible] bordering band paler than dorsal gr[illegible] dashes and two following bands pale drab, the lowest with a greenish gray tinge; lateral band also pale drab, with a pale purplish dorsal border.

This is a broader larva than *antiacis,* and of a different ground color, lacking entirely or in part the pale green of the former species.

Pupa.—Similar in size and form to that of *antiacis,* but the ground color is darker, being wood-brown with paler meta-thorax and wing-covers. The distribution of markings is the same as in *antiacis,* but more obscure, thus giving it a more uniform coloration.

The eggs and larvae of this insect were taken in Marin Co., on the small annual blue lupine (*L. micranthus*). The eggs are laid on the flower buds, or more rarely on the young leaves. The larvae feed upon the tenderer parts of the plant, and when of large size eat through the wall of the pod and devour the seeds. They are not very particular as regards food-plants and will readily eat *Lotus glaber, Astragalus,* and the large yellow lupine. The single pupa obtained (June 10th), 1907, disclosed a male on March 22, 1908.

Lycaena pheres Bdv.

This, like the following "blue" is an early summer species. It was first described by Boisduval, and its habitat given as the environs of San Francisco. This is therefore its typical habitat, and as the food-plant of the larva is *Lupinus chamissonis,* a large maritime blue lupine, true *pheres* is to be found near the sea in the vicinity of these plants, which are common on the sand dunes. No larvae of this blue were reared, but the females were observed ovipositing on the densely tomentose stems of the lupine, some distance below its summit, but always in the vicinity of young leaves and sometimes upon them. The insect flies in May and early June.

There is undoubtedly some confusion as to what *pheres* really is, and it is probable that it has a more restricted range than it is accredited with.

Lycaena icarioides Bdv.

Common in the region about San Francisco, having the same habitat as *behrii,* but appearing much later. The larva likewise feeds upon *Lupinus micranthus,* but it could not be induced to eat other legumes.

Pemphigus tessellata: Alternate Host, Migrants and True Sexes.*

By Edith M. Patch.

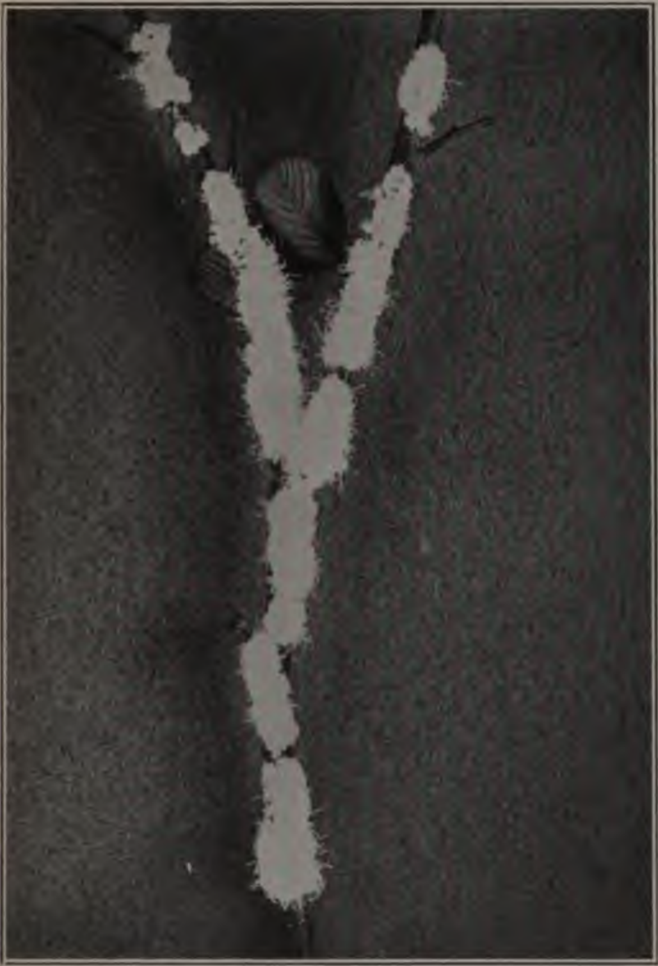
(Plate XXIV)

Ever since Fitch recorded in his brief, original description in 1851 "I have searched in vain for winged individuals of this species," the alder blight has been from time to time an object of speculative interest to aphid observers, although if any real attempt has been made to trace the flight of the migrants and locate the winter eggs it has been heretofore unrecorded.

With a species so conspicuous and of such wide distribution the absence of a knowledge of its different stages for the half century or more since it was described would seem strange were it not that the species certainly gives as defiant a dare to the life history detective as a *Pemphigus* can and that is saying a good deal.

To begin with there seems to be no place in the apparently closed cycle of alder blight for an alternate host and winter eggs. According to the observations of the writer for the past five years, apterous viviparous forms of *Pemphigus tessellata* are present on the alder branches (*Alnus incana*) from about April 20th to late October, weather permitting, and the rest of the year hibernating as young apterous viviparous forms in clusters or singly among the fallen leaves at the base of the alder. The return of these hibernating young to the alder branches in the spring completes an apparent cycle for a single host plant and certainly suggests no need for variety in [illegible]. It was not then with any thought of an alternate host that the observations were begun for this species in Maine but with the feeling that at some time during the year a sexual generation might be found on the alder. Protected under the flocculent [illegible] secreted by the *Pemphigus* the presence of a winged [illegible] [illegible] revealed [illegible] special collection and [illegible] [illegible] the form [illegible] [illegible] September at the same [illegible]

[illegible] Agricultural Experiment Station [illegible]



PATCH ON PEMPHIGUS TESSELLATA.

Showing masses of alder blight, containing both mature and apterous viviparous forms and migrants already winged and ready for flight.

last apterous viviparous generation is maturing and bringing forth an excessively numerous progeny which winter among the leaves on the ground, a generation of large winged forms appears upon the alder stem in flocculent masses containing sometimes a few apterous forms and sometimes in clusters where the apterous forms are the more numerous.

These winged forms take flight without producing young upon the alder, and early in September in those seasons when the species is particularly numerous the flight of this *Pemphigus* is so considerable as to give the appearance of a slight snow storm in the air. The bodies of the migrants are dark but the wings are whitish and powdered and much of the flocculent wax is retained upon the abdomen even in flight.

One such flight was noticed September 1, 1905 and several in late August and early September, 1908. On account of the excessive numbers of syrphus maggots and the larvae of the wanderer butterfly, *Feniseca tarquinius** in 1906 the alder blight was nearly exterminated in the vicinity of Orono that season and during 1907 the colonies were not plentiful. This present season, however, they are again numerous and at the time of their flight a winged *Pemphigus* was seen to be congregating in conspicuous numbers upon the trunks of maple on the campus, particularly *Acer dasycarpum* Ehrh. and the ornamental cut leaved maples. Microscopic examination showed no distinction between the Pemphigus newly alighting upon the maple trunks and these taking flight from the alder and it was with intense interest that the following observations were made.

August 27, 1908. Winged viviparous *Pemphigus* covering the trunk of cut leaved maple. They are seeking the crevices and rough places in the bark and are making no attempt to feed.

August 28, Pieces of bark torn back from maple trunk show the winged viviparous *Pemphigus* and their numerous progeny, minute forms which under a lens prove to be the sexual forms, many of them being in copulation.

August 28. Winged *Pemphigus tessellata* removed from alder before flight and placed in cage upon twigs of maple in laboratory. They settled contentedly upon the twigs. August 30. The progeny of winged *P. tessellata* placed on the maple twigs in laboratory are sexual forms proving upon microscopic examination to be exactly like those collected from under bark of maple on campus.

---

* Me. Agr. Exp. Sta., Bul. No. 134, pp. 216-217.

September 3. Numerous yellow eggs are present under bark among the *Pemphigus* on maple trunks on the campus.

September 4. *Pemphigus tessellata* numerous on wing and observed floating in the air on campus. Individuals were watched and seen to alight on the maple bark where they settled and sought rough places in the bark.

* * * * * * * * * * *

We have, then, unquestionably the oviparous females and males of *Pemphigus tessellata* deposited upon maple trunks by the winged migrants from the alder and the eggs of this species deposited under the bark of the maple. Coupled with the fact that *P. tesellata* hibernates also in the young apterous viviparous form among the leaves at the base of the alder clumps this would seem rather to complicate matters than to prove a missing link.

On the basis of these observations it seems safe to hazard the following guess as a working hypothesis. *Pemphigus acerifolii* Riley, a flocculent species on maple leaves is very [illegible] from spring until mid July. A winged generation then appears and disappears. *Pemphigus acerifolii* has been kn[illegible] upon the maple leaf, the rest of the cycle never having been recorded. With this in my mind my aphid notes were [illegible] for these two species with the following suggestive [illegible]

"No. 1905. *Pemphigus acerifolii* Riley, Orono, July [illegible] Winged forms present in great numbers on leaves of maple [illegible] Ready for migratory flight."

"No. 2005. *Pemphigus tessellata*. Orono, July 18, [illegible] S[illegible] viviparous winged forms scattered about on the alder leaves [illegible] on under side), followed by a group of young apterous [illegible] forms present on the alder branches in great numbers, [illegible] young."

The foregoing record of viviparous *winged* forms on the alder leaves at the time it was taken seemed puzzling as [illegible] pupae, or individuals with wing pads, could be found on the alder tree; but in the light of this fall's observations there seems little reason to doubt that these sporadic winged forms on the leaves of the alder are the return migrants from the maple, and that *Pemphigus acerifolii* Riley is merely the maple name for *Pemphigus tessellata* Fitch, the stem mother of which migrates from the bark to the leaf upon hatching in the spring.

In accordance with my custom for five years, specimens of aphids have been saved, for every record made, either in balsam mounts or as alcoholic material, so that they are ready for reference at any time. During the winter of 1905-06 I made a careful comparison of all the winged species of *Pemphigus* taken in Maine up to that time, and was particularly struck by the fact that mounted specimens of *P. tessellata* and *P. acerifolii* were indistinguishable and made the grumbling comment "If these are two species there is no structural basis for systematic work with Pemphiginae." However, there seemed no place in the *tessellata* cycle for *acerifolii,* several attempts to colonize maple with apterous forms of *tessellata* were entirely unsuccessful and for the next two falls the species was so scarce that the migrants were not much in evidence, and no clue was forthcoming until this fall.

The life cycle of the alder blight is by no means solved by the location of the sexual generation. The true association of *P. tessellata* and *acerifolii* yet remains to be established upon the alder. With the clues now at hand these species (two or one) can unquestionably be traced in time. The abundance of alder and maple at Orono and the usual presence in great numbers of *P. tessellata* and *acerifolii* make it an ideal situation for work with these forms and favor my plans for thorough study of the *Pemphigus* upon the alder and maple.

There is no need of crowding with further details from notes now at hand this preliminary paper, the object of which is merely to place the sexual forms of *P. tessellata* for which the following brief description will suffice.

Oviparous female.—A pale yellowish form, apterous and non-rostrated, measuring 1.33 mm. in length. Antennae of four segments. Two eyes with three separate dark globular pigmented masses. Abdomen ovoid. Deposited by viviparous migrant from alder, in crevices of bark on trunk of maple. Shortly after birth this form sheds a thin white membranous skin which commonly adheres to caudal tip of abdomen. After copulation the female deposits a single large egg.

Male.—Darker than female and greenish. Apterous and non-rostrated, measuring .68 mm. in length. Antennae of four segments. Two eyes with pigmented area in one large irregular mass. Abdomen linear. Sheds skin after birth as does the female. This form is smaller than the egg it fertilizes.

Egg.—Comparatively large egg filling most of the abdomen of the female and measuring about .83 mm. It is yellow and glistening and deposited usually with a downy white secretion.

* * *

Notes on an Orthopterous Leaf Roller.

By W. L. McAtee, U. S. Biological Survey.

(Plate XXV)

Under a title, by prefixing two words to which, I have formed that of the present article, Mr. A. N. Caudell [illegible] described* some exceptional habits of *Camptonotus carolinensis* Gerstacker. While I have but little, I fear, to add to Mr. Caudell's excellent account, the accompanying plate [illegible] will, I hope, prove welcome, especially since one of them, in a way, illustrates his article as well as my own.

On August 2, 1908, while collecting insects on Plummer's Island, Md., in company with Mr. E. A. Schwarz, a heavily fruited specimen of the bladdernut (*Staphylea trifoliata*) attracted my attention and I proposed that we examine it for insect work. A brief inspection showed that a great many of the swollen triangular pods had rather large irregular holes in them. Mr. Schwarz, in opening one, disclosed a [illegible] which escaped, but not before I recognized it as *Camptonotus*. A minute later, discovering another, I succeeded in keeping it in its lair, one of the 3 roomy cells of the bladdernut, in wh it was snugly curled, the long antennae, to my surprise, being completely withdrawn. These two were all that could be found on the bush. On August 15, Messrs. Schwarz and Knab looked over this bush again, and collected all of these locustids they could find. The next day I examined the same individual shrub and captured two more, which indicates that in all probability the insects change quarters frequently and that one night is sufficient time for them to become comfortably installed.

---

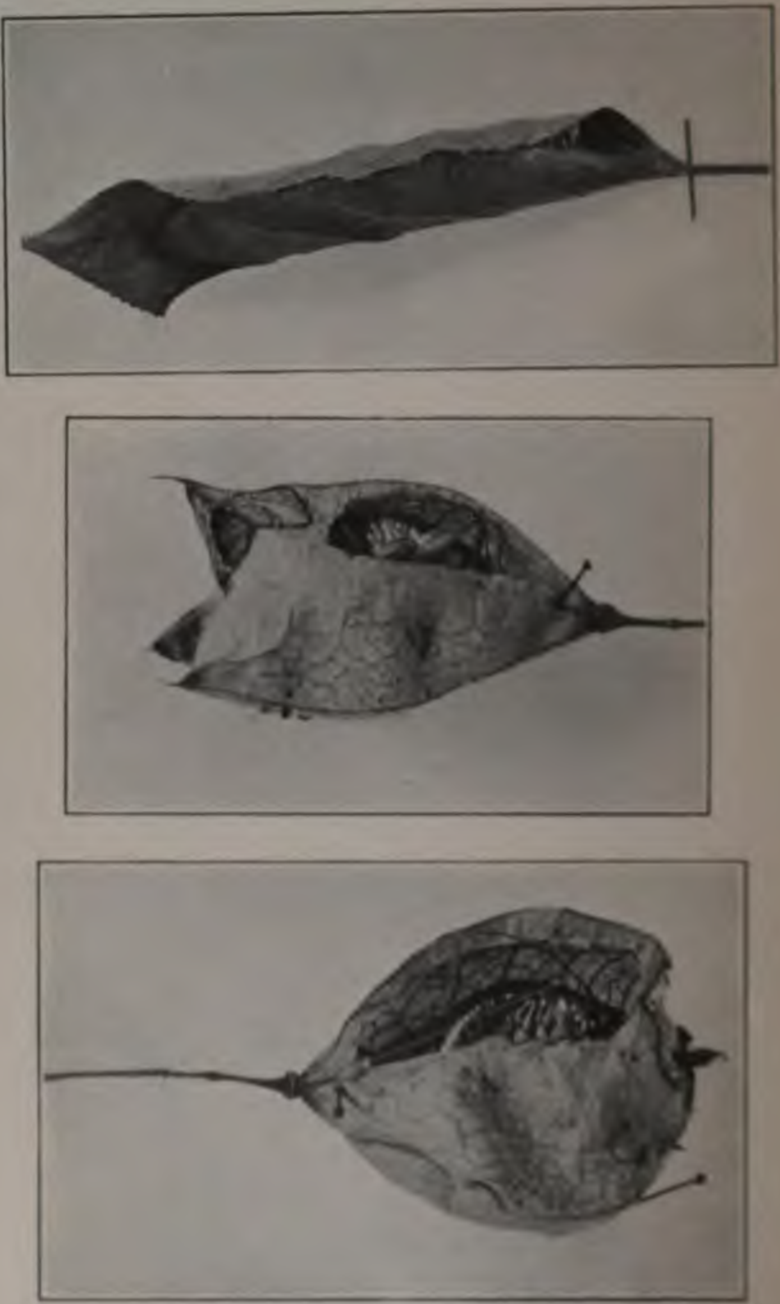
*Proc. Ent. Soc. Wash. Vol. VI, pp. 46-49, 1904.

On the same day an extended search, covering several bushes of *Staphylea*, revealed *Camptonotus* in numbers. I collected eight and could easily have secured a score. Three of the eight were males, which, heretofore, have much more rarely been collected than females. Carefully examining the first pod in which a *Camptonotus* was found, it was seen that as usual, a large irregular opening had been made in one of the cells, but it had been closed by a loosely constructed door, composed of bits of the pod and a network of fine spun silk-like threads. The locustid was visible within and scuttled about when the pod was handled, but did not attempt to bolt out like the first ones found, which probably were not spun up. Several other pods were found to be similarly inhabited. In some the opening had been closed by a well woven continuous sheet (see middle figure, Plate XXV). Apparently nothing in the pods was eaten, they serving only as shelters.

Some specimens of *Camptonotus* and twigs of *Staphylea* were brought home and the twigs placed in water under bell jars. In a large jar two females and one male were confined with a twig bearing several entirely uninjured pods and many leaves. They were watched for some time by a light but did nothing with the plant. They sometimes moved nervously about, sometimes sat motionless, but they also spent much time cleaning all accessible parts of the body (even including the ovipositor in the case of the females), with the mouth. During this process they showed wonderful control of the long antennae, which after being pulled down one at a time by the fore legs, by great muscular power at the base were slowly drawn between the mandibles for their whole length. The dexterity with which they manipulate these seemingly unwieldy appendages (which are about five times the length of the body), leaves the observer in no doubt as to how they stow them away in the cramped confines of their improvised retreats. Leaving the locustids in darkness for a while, no change was noticed upon returning, except that the male had ensconced himself in his old cell in a pod that has been left lying on the floor of the receptacle. From it he was reluctantly dislodged. They were then left for the night.

In the morning it was found that both females had made cells for themselves, not however in the pods, but in leaves. Each had neatly rolled up a leaf, after making an oblique (with reference to the midrib) cut on one side near the petiole end. (See top figure, Plate XXV). At or near their edges the two halves of the leaf were bound together by fine silk-like strands, and I was fortunate enough to see one of the females finishing her work, she being inside the pocket. The thread flowed from between the points of the mandibles, then the palpi, and in fact the whole mouth mechanism moving incessantly. The head was swung from side to side and the mandibles merely touched to a spot, first on one flap of the pouch and then on the other, to which the thread immediately adhered. Rather an elaborate web was made across the [illegible] open upper portion of the pouch, but a passageway was left open.

Later in the day, while I was necessarily absent, my wife observed the male making a pouch. Only through her watchfulness am I able to give an account of this interesting process. The male, be it remembered, did nothing throughout the night and he was further inactive till about 10 A. M. For an hour he had sat motionless on a leaf (which had a ragged laceration almost reaching the midrib near the tip) when at seven minutes before ten o'clock he turned facing the apex and grasped the edges of the leaf with three legs on each side, pulled them toward each other till they were separated by a space of only about a quarter of an inch, and immediately began to run lines from edge to edge. Backing a little more



McATEE ON CAMPTONOTUS CAROLINENSIS GERSTACKER.

threads were spun, then the insect went to the tip end, crawled into the tube he had just formed, and began to bind the edges together on the inside, at the petiole end, then returning to the apical end, then worked at the middle, rested, and finally spun in the open place near the mouth of the pocket. The sides were noticeably drawn together as he worked near the middle on the inside. Also, when the insect crawled over the first work done, while still on the outside, the edges were squeezed nearer together by the legs, and were held there, the threads becoming more oblique. The whole process was finished 2 minutes before ten. After completing the pockets the insects lie very quietly within them for hours. The work done by these captive *Camptonotus* indicates that they have no choice as to whether the mouth of the pouch shall be at the apex or base of the leaf. Their adaptability is shown by the use of a leaf weakened by injury, obviating the necessity of making a cut, as well as in the recognition of the pod of *Staphylea* as a handy substitute for a rolled leaf.

Although three specimens of *Camptonotus* were confined for two days with uninjured pods and no leaves, not a pod was disturbed. Hence it is not proven that the locustids enter them through openings of their own making. Nevertheless, it is very probable that they do so; certainly they have mandibles equal to the task. The pods may be used for only a short period. At any rate, on August 23, not a *Camptonotus* could be found where a week before they were numerous. However, on this date two specimens of *Orocharis saltator* Uhler, were discovered in torn pods. Mated pairs and nymphs of *Banasa* also were frequently found.

EXPLANATION OF PLATE XXV.

Top Figure: Leaflet of *Staphylea trifoliata*, rolled by *Camptonotus carolinensis*.

Middle and Bottom Figures: Pods of *Staphylea*, with walls of cell cut away, showing *Camptonotus*, ensconced within. On upper left hand part of middle figure, note well woven sheet closing the entrance to cell.

* * *

Mr. Fordyce Grinnell, Jr., collected last summer in the San Jacinto Mountains of southern California. Messrs. Grinnell and Bradley made a collecting trip to the summit of Mount Wilson in September.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., DECEMBER, 1908.

We not infrequently receive lists of species of insects for insertion in this journal that are hardly worth publishing and we also publish some that are hardly worth the room they take up. Our object in doing this is to encourage the writers and also in the hope that the lists may contain the names of some insects that will be of use in showing distribution later on when such matter is collated. The people who send these lists go out and turn over a few logs and pick up the conspicuous common and widely-distributed forms and generally overlook the species peculiar to the district. In other words, they [illegible] superficial in their work and do not wait until they [illegible] a list that is complete enough to be of value. Some [illegible] we received a sending of Diurnal Lepidoptera from [illegible] and strange to say the box did not contain a single species that is not found in Pennsylvania. We recognize the great [illegible] of faunal lists when they really represent the local district where they are taken and we are glad to publish them as space permits. On the other hand a list that is only a [illegible] skimming and contains the names of species that get [illegible] of the collector and are found from Winnipeg to [illegible] from Cape Cod to the Golden Gate is scarcely worth while.

◆

The entomological societies of New York, Brooklyn and Newark [illegible] a dinner at the Imperial Hotel, Brooklyn, on November [illegible] of Professor John B. Smith, State Entomologist of New [illegible] on that date celebrated his fiftieth anniversary.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

MR. A. F. SHULL is now at Columbia University.

MR. HENRY L. VIERECK is now connected with the Park-Davis Co., at Detroit, Mich.

MR. LEONARD HASEMAN has been appointed assistant in entomology at Cornell University.

MR. CHESTER JARVIS, of the Storrs' Connecticut Exp. Station is spending a few weeks at Cornell University.

PROF. C. F. BAKER has returned to the United States and will teach in Pomona College at Claremont, California.

PROF. GLENN W. HERRICK, formerly of the Mississippi Agricultural College, is now located at College Station, Texas.

DR. J. A. NELSON is conducting investigations on the embryology of the honey bee for the U. S. Bureau of Entomology.

DR. A. FENYES, of Pasadena brought back from Cordoba, Mexico, this summer a very fine series of Coleoptera, especially Aleocharinæ.

THE following species taken this year are new to me: *Cyaniris ladon, Thorybes pylades, Nathalis iole, Papilio glaucus.*—F. M. HOLMES, Prescott, Iowa.

MR. A. G. HAMMAR, formerly of Ithaca, N. Y., has recently been engaged in the investigation of grape insects at North East, Pa., for the U. S. Bureau of Entomology. He has now returned to Washington.

PROF. E. B. POULTON, of Oxford, England, is one of the invited speakers at the Darwin Celebration, convocation week, in Baltimore. He will also give the annual address before the Entomological Society of America.

C. F. ADAMS, A.M., M.D., Professor of Entomology, has been appointed Acting Dean and Director of the College of Agriculture and Agricultural Experiment Station, of the University of Arkansas at Fayetteville.

C. W. HOWARD, A.B., F.E.S., has resigned his position of government entomologist of the Transvaal to become Chief of the Division of Entomology of the government of Portuguese East Africa. His address is box 255, Lourenco Marquez, P. E. A.

AT THE St. Louis Exposition, New Jersey had an interesting exhibition of mosquitoes, showing not only the different species and their life-histories but also the natural enemies of mosquito life. While I was looking over this collection, two ladies approached it, one of them reading aloud the placard, "New Jersey Mosquito Exhibit." They stood gazing down into a case of large dragon flies for a few moments, and then one exclaimed, "Dear me, I'd heard of New Jersey mosquitoes, but I'd no idea they were as large as that."—F. M. HOLMES, Prescott, Iowa.

Doings of Societies.

At the meeting of the Feldman Collecting Social held September 17, 1908, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, seventeen members were present, also Mr. O. T. Elleder of Russia, Mr. W. S. Fisher of Highspire, Pa., and Mr. R. Pearce of Philadelphia, visitors.

Prof. Smith spoke of the spread of *Daremma catalpae* B[illegible] throughout the State of New Jersey and its great abundance during several years. In 1906 it began to lessen in numbers [illegible] the regions that were first invaded, and parasitism became more obvious. In 1907 this tendency became even more marked, and during the season of 1908, the larvae were really rare in most parts of the State, parasites seeming to have caught up with the species, and brought it under control. He also spoke of other natural controls of injurious species and expressed his opinion that no one kind of check was [illegible] for all species, that diseases in one case did what parasites did in another, and that weather conditions were often as important as either, acting independently or with one or both the other factors. Some cases of hyper-parasitism were also referred to as influencing the effect of the primary [illegible] cussed by Mr. Viereck, Prof. Calvert and Dr Skinner.

A letter from Mr. Roswell H. Johnson to Mr H W W[illegible] was read and specimens illustrating the color variat[illegible] *[illegible]podamia convergens-quinquisignata* group were [illegible]

Mr. H W. Wenzel exhibited pieces of floor board[illegible] story of a club house at Anglesea, N J., which were [illegible] with *Hylotrupes bajulus*. The work of the insect [illegible] until the destruction is complete. Dr. Skinner spoke [illegible] of the same insect, where the damage done was [illegible] until the piano had fallen into the cellar

Mr Elleder spoke about his collecting of [illegible] country He has been collecting in and near Phila[illegible] about one year, and finds that many of the famil[illegible] are [illegible]paratively rare here The *Cicindela* on the other hand are [illegible] presented in all of Russia by only four species, while [illegible] are very numerous, and he suggested that a C[illegible] be incorporated in the coat of arms of New Jersey. The g us *Carabus* he finds poorly represented here; he also referred to a species of *Rhipiphorus*, probably *dimidiatus*, which he found in numbers at National Park, N. J. on *Monarda punctata*.

Mr. Harbeck said that he found *Rhipiphorus* species quite common at Trenton, N. J. this year.

Mr. H. W. Wenzel said that *Cychrus viduus* had been very rare for many years, until within last two or three years, since which time a few specimens have been taken in the vicinity of Philadelphia. The same speaker reported the capture of a pair of *Chlaenius prasinus* at Philadelphia on July 14th and 23d. This species was not known to the speaker from this locality, being a mountainous species.

Prof. Calvert exhibited a specimen of *Erebus odoratus*, which was found alive, resting on wall in room of Biological Hall, University of Pennsylvania, on August 27, 1908. On the same day a specimen of the same species flew into the window at the Academy of Natural Sciences. On this and the preceding day a storm said to have come from the Gulf of Mexico occurred.

Mr. Geo. M. Greene exhibited a block made of peat, used as a setting board for Coleoptera.

Dr. Skinner called attention to the fact that small species of insects from the tropics have been almost entirely neglected, and that these should be more studied.

Prof. Smith suggested that window screens should be painted with kerosene to prevent mosquitoes from coming in through the same, which, however, proves effective for a while only.

Mr. Viereck after having made further investigations with Culicid larvae in fresh water from the "Philadelphia Neck," found the most of the specimens to be *solicitans*, and some *pipiens*.

Mr. Charles Greene exhibited specimens of the following Diptera: *Ceraturgus cruciatus* Say, taken at Germantown, Philadelphia, July 2, 1908; *Heteropogon gibbus* Loew., Glenside, Pa., Sept. 1, 1908; *Myiolepta varipes* Loew., Roxborough, Philadelphia, June 7, 1908, by George M. Greene; *Trichopoda cilipes* Wied., Newtown Square, Pa., August 23, 1908, by

George M. Greene; and *Spogostylum cephus* Fab., Germantown, Philadelphia, July 2, 1908.

Dr. Castle exhibited two specimens of *Clerus quadrisignatus* taken at Linglestown, Dauphin Co., Pa., June 27, 1908.

Mr. Fisher said that he found the same Clerid very common at night, running around dead hickory trees near Harrisburg.

Mr. Daecke reported *Euaresta aequalis* Loew. very plentiful at Philadelphia on August 30th and September 5th this year, having taken twenty specimens in one sweep on clotbur, *Xanthium strumarium* L. while heretofore he had taken but two specimens, one of these at Baltimore, Md. Also the Geometrid *Euchoeca albovittata* Guen. was very common this year, and particularly at Castle Rock, Pa., on May 26th. The same speaker reported the capture of *Atteva aurea* Fitch at National Park, N. J. on August 2nd and 4th, resting on *Asclepias cornuti*, which is probably a new record for the State; at the same place and date he found *Culex jamaicencis* very common. He also reported the capture of a specimen of *Bembex spinolae* with a *Tabanus nigrivittatus* in its grasp.

FRANK HAIMBACH, *Secretary.*

At the meeting of the Feldman Collecting Social held on October 22, 1908, at the residence of Mr. C. Few Seiss, [illegible] Spring Garden Street, Philadelphia, fifteen members were present.

Mr. Laurent exhibited a breeding cage consisting of the old fashioned high fly trap, placed over a flower pot. The speaker stated that he had been very successful in rearing [illegible] larvae in these cages. Mr. Laurent also pointed out some deficiencies in certain naphthaline cones which have been recently placed on the market.

Dr. Skinner spoke of the great value of melted naphthaline as an insecticide for all household insect pests. Where insects hide in houses, due to defective woodwork or poor carpentering, naphthaline may be used with entire success. It melts at a very low temperature and on being poured into cracks or crevices sets immediately and hermetically seals them. It is most effective used this way against ants, roaches, fleas and bedbugs. Care should be taken to prevent flame coming in contact with the melted substance or the fumes as it is very inflammable.

FRANK HAIMBACH, *Secretary.*

A meeting of the American Entomological Society was held October 22, 1908, Mr. Philip Laurent presiding. Nine persons were present.

Mr. Daecke exhibited a specimen of *Argynnis cybele* enclosed in a Riker mount which had been partially destroyed by an *Anthrenus* though the mount was tight.

Dr. Skinner exhibited butterflies that had been mounted between sheets of mica 163 years ago. He also showed the male of *Plagodis schuylkillensis* Grossbeck, taken at the Falls of Schuylkill, Philadelphia in August.

Mr. Weigand reported having captured a new species of *Cucullia* in Fairmount Park, Philadelphia, on New England asters.

Dr. Skinner exhibited both sexes of *Trogolegnum pseudambulyx* Bd., a large sphinx moth taken at Real del Monte, Hidalgo, Mexico, by Mr. H. T. Van Ostrand. The sexes differ to a marked degree.

Mr. Hornig said he had recently seen a number of Odonata mating and asked if it were not late in the season for this.

Mr. Laurent remarked that he had *Pamphila hobomok* hibernate as egg, larva and chrysalis.

Dr. Castle exhibited a naphthaline cone covered with a paper cover to prevent soiling the box. A tuft of cotton was put in the small end of the paper cone.

The death of Dr. Wm. H. Ashmead on October 17th was announced. He was a corresponding member of the Society.

HENRY SKINNER, *Secretary*.

The June meeting of the Heink Entomological Club of St. Louis, Mo., occurred on the 20th at the residence of Mr. C. L. Heink, who presided.

Mr. Schroers spoke on collecting pupae of *Ecpantheria deflorata*, which, he said, are found only where logs or trunks of trees are infested with ants. His opinion is that the ants prevent the intrusion of parasites that might injure the pupae, which are themselves protected from the attack of ants by the silken web in which the pupae are encased.

Mr. Heink took the members through his "butterfly farm," a building he had erected with the sole purpose of rearing Lepidoptera. Instead of the usual breeding cages, he uses twelve gallon carboys, cutting out the top so as to leave a circular opening about ten inches in diameter. A mixture of sand and dirt to a depth of two inches is then put in the bottom of the carboy. When in use, this is thoroughly moistened and the stems of the food plant are placed therein. The top is then tightly coved with wax paper. Whenever the moisture becomes excessive a screen is used to cover the top, instead of the wax paper. In this way the twigs retain their freshness for weeks, in fact, until every vestige of foliage has been consumed by the larvae.

AUG. KNETZGER, *Secretary*

- - - - - -

The September meeting of the Heink Entomological Club took place on the 12th at the residence of Mr. A. C. Kelbly, St. Louis, Mo., Mr. Heink in the chair. Mr. Julius Meyer was elected a member.

Mr. Kelbly exhibited a lot of Heterocera, comprising several hundreds of specimens, which he took at the electric lights of the West End Hotel. Among them are a monstrous pair of *Marumba modesta* and several varieties of *Apantesis*. Mr Graf gave an account of his visit to Cliff Cave, five miles south of the city. He found no insects in the cave

AUG. KNETZGER, *Secretary*

The October meeting of the Heink Entomological Club occurred on the 31st at the residence of Mr. Schroers, St. Louis, Mo., Mr. Heink presiding.

Mr Heink reported that while on a collecting trip to Cliff Cave last summer he saw a grasshopper feeding [illegible] in the skin of a larva of *Dolba hylaeus* which was feeding on a pawpaw leaf.

Mr. Schroers exhibited an aberration of *Neonympha* [illegible] which he took at Cliff Cave. This specimen has two [illegible] placed side by side on the upper surface, near the anal angle of each secondary. The under surface of the wings is [illegible] striated, while the arrangement of the ocelli differs [illegible] of a normal specimen.

Mr. Kelbly exhibited a specimen of *Pyrameis* [illegible] from Australia and a specimen of *P. cardui* taken here, and showed hardly a trace of difference in markings.

AUG. KNETZGER, *Secretary*

The 26th regular quarterly meeting of the Pacific Coast Entomological Society was held on November 23rd, 1907, at the residence of Dr. F. E. Blaisdell, 1632 Post street. President Fuchs in the chair.

The Annual Election of officers took place with the following results: *President,* Dr. E. C. Van Dyke; *Treasurer and Secretary,* Dr. F. E. Blaisdell; *Assistant Secretary,* Leon Munier.

Mr. Edw. Ehrhorn made remarks of appreciation for the services rendered to the Society by the retiring President, Mr. Chas. Fuchs.

Mr. F. X. Williams reported the result of his collection trip to Siskiyou Co. during the last summer.

Mr. R. W. Doane reported some entomological work at San Diego, Calif. Also results in collecting there in April, stating that some interesting *Tipulidae* were taken. On foggy nights he found insects very abundant about arc lights. Mr. O. E. Bremner gave a talk on the White Fly.

Mr. J. C. Huguenin reported results of collecting Coleoptera in San Francisco Co. Mr. J. G. Grundel gave an account of his collecting trip to Eureka.

Mr. Ehrhorn spoke on the photographing of insects, and exhibited photographs.

Dr. E. C. Van Dyke then entertained the Society by reporting his recent trip to the Aleutian Islands. The results will be published later, when the material shall have been worked up.

Dr. Blaisdell exhibited several species of Coleoptera taken in Alpine Co., California. Among which were *Cicindela sierra,* showing variations in color from dark with a small apical lunule to the fully marked, bright green examples; *Deretaphrus oregonensis, Bius estriatus, Mycetina hornii, Liodes bicolor, Platycerus opaca* Fall, and *Quedius debilis.*

Dr. Van Dyke exhibited two boxes of Coleoptera from the Aleutian Islands, many not heretofore recorded from that region.

Dr. Blaisdell reported that the 24th and 25th meetings of the Society were not held on account of the car strikes.

F. E. Blaisdell, M. D.
Secretary.

The 27th regular quarterly meeting of the Pacific Coast Entomological Society was held on February 22nd, 1908, at the residence of Dr. F. E. Blaisdell, 1632 Post street, President Van Dyke in the chair.

President Van Dyke delivered an address, reviewing the progress of Entomology on the Pacific Coast, after which Percy Baumberger presented a gavel to the President with a few appropriate remarks.

E. T. Cresson, Jr., spoke of the work done by Osten Sacken in the Seventies and also that of Pilate in Collecting of Diptera in Louisiana.

Mr. Edw. Ehrhorn talked on the parasites of *Phryganidia californica*, two new species being bred.

Chas. Fuchs reported a collecting trip to St. Helena and Placer Co.

Mr. F. X. Williams exhibited a box of Sesiidae. Mr. E. T. Cresson, Jr., and G. R. Pilate were elected to membership.

F. E. Blaisdell, M. D.,
Secretary.

The 28th regular meeting or Field Day of the Pacific Coast Entomological Society was held at Muir Woods, Marin Co., California, on May 17th, 1908. Eight members and [illegible] guests participated in the outing.

The Coleopterists collected the following interesting [illegible] *Dendroides picipes*, *Platyceras oregonensis* and [illegible] *Megapenthes elegans*, *Ernobius* sp., *Phymatodes aeneus*, *Pterostichus scutellaris*, *Bembidium spectabile*, *Lept*[illegible] *Trichochrous laticollis*, *Corphyra bivittata*, *Tri*[illegible] *Amnesia granicollis*, and *Desmocerus cribripennis*.

The Lepidopterists found very little in their line.

Mr. E. T. Cresson, Jr., found many good Diptera.

Mr. Ehrhorn took a few Coccidae and Mr. Fuchs a few Pselaphides by sifting.

The day was thoroughly enjoyed by the members and [illegible] several interesting catches made them enthusiastic.

F. E. Blaisdell, M. D.,
Secretary.

INDEX TO VOLUME XIX.

(Notes and articles on geographical distribution are indexed under the names of the States or countries concerned, and *not* under the species listed therein, except in the case of new or redescribed forms. New generic and specific names are marked with a *.)

GENERAL SUBJECTS.

Academy of Natural Sciences of Phila., Entom. Section of 440
Alberta collecting in 85, 108
Altitude and distribution of species 347, 360
American Entomological Society 497
Angolan insects of economic or pathologic importance 26, 224
Arizona, collecting in 87
Association of County Entomologists of California ... 149
Asymmetrical insects 191
Breeding cages 496, 497
Brooklyn Entomological Society 84, 85, 142, 184, 238, 239, 347, 348, 439.
Bubonic plague, role of insects in transmitting 353, 380
Butterflies at ball 79
Card index system 188
Commensalism 497
Convergence in structure ... 441
Death of insects, causes of 189, 439.
Directory of Jesuit Naturalists 291
Disease, flies and human 384, 389 472.
Dryness and wingedness 122
Ear, removal of insects from the 317, 339
Editorials, 34, 78 140, 181, 233, 290 338, 384, 436, 492.
Eggs laid by insects, Number of' 4, 383
Entomological Literature, 35, 79 182, 183, 291, 339, 385.
Entomological Society of America 78, 90, 493
Environment on colors, Effects of 87, 147, 340
Errata 183
Examining insects under compound miscroscope 139
External wing buds in larvae of holometabolous insects .. 135
Feldman Collecting Social, 46, 185, 186, 188, 240, 342, 343, 389, 494, 496.
Fighting moths with lights ... 387
Floor-boards, Insect injury to 494
Graduate School of Agriculture of N. Y., Entomology at 340
Happy Family of Bugologists (poem) 294
Harrisburg Natural History Association 236, 344, 345
Heink Entomological Club, 55, 89 237, 238, 346, 497, 498.
Household insect pests, Use of naphthaline against 496
Human fleas 353, 380, 435
Hybrids 88
Illustrations of insects, How to make 140
Inflation of larvae 9
Insectivorous bats, Economic value of 184
Insects as food for man 29, 31, 32
Journal of Economic Entomology 79
Kellogg's "Insect Stories" ... 385
Killing flies, Mixture for 389
Local lists of insects 492

Mexico, Insect-formed ooliths in ... 291
Mimicry, 46, 224, 228, 230, 344
Mollusks, Blow-flies in dead. 234
Mouse-flea, A new ... 435
Myasis in man ... 32
Nason collection ... 75
Newark Entomological Society, 86, 87, 88, 188, 189, 390, 392.
Numerical distribution of insects ... 324, 393
Obituary:
    Ashmead, W. H. ... 397
    Biolley, P. ... 394
    Davis, C. A. ... 234
    Finot, P. A. P. ... 306
    Fletcher, J. ... 445
    Johnson, W. G ... 242
    Konow, F. W. ... 348
    Mayr, G ... 396
    Ridings, J. H. ... 242
    Seib, S. H. M. ... 306
    Snow F. H. ... 447
    Thomas, J. ... 142
Ohio Lake Laboratory ... 292
Ooliths due to insects ... 291
Pacific Coast Entomological Society ... 499, 500
Paraffin sections attacked by insects ... 442
Parasites as cause of death of insects ... 189, 439
Personals
    Adams, C F ... 493
    Baker, C F ... 380, 493
    Barrett, O W ... 79
    Bradley, J C ... 491
    Busck, A ... 322
    Calvert, P P ... 183, 437
    Cresson, E. T ... 289
    Cresson, E T, Jr ... 55
    Daecke, E. ... 322
    Fenyes, A ... 493
    Ferdinand, King [illegible]
    Fernald, C. H [illegible]
    Froggatt, W. [illegible]
    Fullaway, D. T [illegible]
    Grinnell, F., Jr [illegible]
    Hammar, A G [illegible]
    Haseman, L. [illegible]
    Hebard, M. [illegible]
    Herrick, G. W [illegible]
    Hinds, W E [illegible]
    Holland, W. J [illegible]
    Howard, C W [illegible]
    Jarvis, C. [illegible]
    Kellogg, V L [illegible]
    Kincaid, T [illegible]
    Laurent, P [illegible]
    McCook, H C 141 [illegible]
    Mitchell, E G [illegible]
    Montgomery, T H., Jr [illegible]
    Nelson, J A [illegible]
    Patch, E. M [illegible]
    Poulton, E B [illegible]
    Quayle, H J [illegible]
    Rehn, J A G [illegible]
    Rivera, M J [illegible]
    Shull, A F [illegible]
    Slingerland, M V [illegible]
    Smith, J B [illegible]
    Van Duzee, E P [illegible]
    Van Duzee, M C [illegible]
    Viereck, H L [illegible]
    Wenzel, H W [illegible]
    Wheeler, W M [illegible]
Pitcher plant insects [illegible]
Plants attacked by insects
    Acer [illegible]
    Alder [illegible]
    Alnus [illegible]
    Ampelopsis [illegible]
    Apple [illegible]
    Astragalus [illegible]
    Bean [illegible]
    Blackberry [illegible]
    Bladdernut [illegible]
    Boneset [illegible]

Brassica 314
Catalpa 197
Cat-tail rush 295
Celtis 368
Cherry 142
Chestnut 101
Chrysanthemum 261
Cotton 210
Crinkle-root 142
Cucumber 227
Dentaria 142, 314
Eupatorium 168
Grass 438
Grenadilla 229
Hackberry 368
Hickory 118, 119, 241
Honey locust 119
Iron-weed 166
Jacobinia 211
Live oak 13, 77
Lotus 481, 483
Lupinus 481, 483
Malus 101
Maple 104, 131, 241, 485
Melon 227
Onion 234
Papaya 229
Passiflora 229
Pinus 390
Pitcher-plants 150
Poplar 1
Populus 1, 69, 103
Potato 230
Prunus 142
Quercus, 13, 77, 105, 106, 119, 349.
Salix 69, 102
Salvia 383
Sarracenia 150
Shade trees 84, 238
Staphylea 488
Thoroughwort 168
Timber trees, African.. 28, 228, 229.
Typha 295
  Vernonia 166
  Virginia creeper 143
  Walnut 118, 119
  Willow ..102, 118, 142, 443
Poisonous insects 467
Pollination by insects 153
Popular fallacies regarding insects 467
Publications of the Bureau of Entomology 183
Rat fleas 353, 380
Relaxing single parts of dried insects 139
Scapanus, Flea from 452
Setting board, Peat 495
Size of copulating insects, Relative 188, 240
Smell in mosquitos, Sense of 81
Specialists willing to determine insects 42
Squirrel flea 462
Stereoscopic pictures of insects 442
University of Illinois, Entomology at 338
Warning against unscrupulous dealers 337
Wings for lantern slides 83

ARACHNIDA.

americana*, *Tumidalvus* 244
Angola, A. of............... 27
Blood-sucking ticks 27
flavus*, *Phthiracarus* 450
Illinois, Acarina of 245, 451
moubata, *Ornithodoros* 27
Poisonous spiders 469
rotundus*, *Phthiracarus* 451
Tumidalvus* 243

COLEOPTERA.

Acid-ejecting C. 229
Alabama, C. of 163
Angola, C. of, 26, 28, 31, 224, 226-230.
antaeus, *Strategus* ...286, 390, 461

Aleocharinae of U. S. and Canada ... 56
Aquatic C., How to collect and mount ... 392, 393
Arizona, C. of, 161, 163, 188, 241, 320.
Arrow-poison from C. ... 229
California, C. of, 66, 160, 499, 500
Chariessa ... 70
Cicindela, Distribution of by altitudes ... 360
Cicindela, Parasite of ... 91
Coccinellid eggs, Aphid feeding on ... 132
*davisi**, *Hister* ... 318
Diamphidia ... 229
*ferrisi**, *Agrilus* ... 368
ferrugineus, *Bradycinetus* ... 459
*fieldii**, *Thyce* ... 160
Florida, C. of ... 187, 428
*fuscula**, *Polyphylla* ... 161
Geotrupes ... 288
Horn-Roeschke School ... 38
Injurious C., 26, 28, 224, 226-8, 230
lazarus, *Bolboceras* ... 400
*lenta**, *Lachnosterna* ... 162
Listrochelus ... 164, 310
*lobata**, *Lachnosterna* ... 163
Long Island, C. of ... 84, 348
Massachusetts, C. of ... 114, 217
Megilla feeding on aphids ... 132
Megilla, Parasites of ... 202
Necrophorus ... 120
New Jersey, C. of, 187, 241, 318, [illegible] 402, 404, 405
New York, C. of ... 84, 348, [illegible]
niger, *Sandalus* ... 288
North Carolina, C. of, 286, 400, 459
[illegible]* ... 320
[illegible] ... 240
Ohio, C. of ... [illegible], 386, [illegible]
[illegible] *Necrophorus* ... 120
[illegible] ... 216
Pennsylvania, C. of, 325, 343, [illegible] 405, [illegible]
silicea, *Diplognatha* ... [illegible]
splendens, *Strategus* ... [illegible]
Strategus ... [illegible]
Stridulation in *Necrophorus* ... [illegible]
*tarsalis**, *Listrochelus* ... [illegible]
Tennessee, C. of ... [illegible]
*texana**, *Chariessa* ... [illegible]
Texas, C. of ... [illegible]

DIPTERA.

acutus, *Ceratophyllus* ... [illegible]
aenia, *Chaetopsis* ... [illegible]
anale, *Spogostylum* ... [illegible]
Angola, D. of, 26, 28, 30, [illegible] 227-8.
*arcuatus**, *Rhypholophus* ... [illegible]
Argyrophylax ... [illegible]
Arizona, D. of ... [illegible]
Bibio ... [illegible]
Blood sucking D. of Angola, [illegible] 227, 228
*brevicornis**, *Pachyrhina* ... [illegible]
California, D. of, [illegible] 380, 437, 452
*californica**, *Pachyrhina* ... [illegible]
Canada, D. of ... [illegible]
Calliphora ... [illegible]
Ceromasia ... [illegible]
[illegible]
Colorado, D. of ... [illegible]
*cornutus**, [illegible]
[illegible]
Culex ... [illegible]
Culicidae, classification ... [illegible]
*Dicranomyia** ... [illegible]
[illegible]
[illegible]
[illegible]
Eggs of [illegible]
[illegible]
[illegible]
[illegible] plague, [illegible]
Flower maggot ... [illegible]
floridana, *Psychoda* ... [illegible]

foliora*, Cecidomyia 350
frontalis*, Oscinis 273
Glossina 26, 42
Guiana, D. of Dutch......... 95
House-flies as disease-carriers 384, 389, 472
House-fly, Possibility of exterminating 345
Idaho, D. of 98
longicornus*, Rhypholophus .. 201
luteola, Auchmeromyia....... 31
Maryland, D. of 496
Massachusetts, D. of 9, 349
Michigan, D. of 179
Missouri, D. of 274, 285
Montana, D. of 178
"Mosquito Life," Mitchell's.. 37
Nevada, D. of 178
New Hampshire, D. of 9
New Jersey, D. of 22, 46, 390, 441, 443, 473.
New York, D. of 201, 202
niger*, Ceratophyllus 434
nigra*, Oscinis 272
nocturnala, Psychoda 277, 279
North Carolina, D. of 168
obscuricornis, Melieria 98
occidentalis*, Pachyrhina 177
ornatus*, Corypsylla 452
Oscinis 272
Oviposition of _Bibio albipennis_ 76
Pachyrhina 173, 405
palposa*, Zeugma 96
parallelus*, Rhypholophus ... 202
Parasitic D. 91, 235, 298
penetrans, Sarcopsylla 224
Pennsylvania, D of, 9, 187, 241, 336, 344, 345, 390, 464, 495 496.
perturbans, Culex 473
Proctacanthus catching _Bombus_ 440
Psychoda 275
Rhypholophus 200
Sarcophaga pollinating _Sarracenia_ 155
serpentina, Anastrepa 98
simplex, Heptaphlebomyia ... 28
Smell in mosquitos, Sense of 81
snowii*, Pachyrhina 176
Stomoxys as a plague transmitter 358
Tabanidae of Angola 228
Tabanidae of North Carolina 168
Texas, D. of 235, 273, 274
Tipula larvae, Outbreak of ... 437
Tipulidae, Variations in 405
trifasciata, Ortalis 298
Tse-tse fly 27, 42
tuberosa*, Xanthacrona 97
Washington, D. of 7, 9, 178, 201, 202.
Wyoming, D of 177
Zeugma* 95

HEMIPTERA.

ancylus, Aspidiotus 309
Angola, H. of 27, 229
Aphid feeding on Coccinellid eggs 132
Aphididae 1
Aphididae, Parasites of 365
Arizona, H. of 234
Aspidiotus 309
bicoloripes, Phonergates 27
Chaitophorus 131
circularis, Aspidiotus 309
citri, Pseudococcus 383
Colorado, H. of 1
Corixa?, Ooliths formed from eggs of 292
Florida, H. of 424
folsomii*, Aphis 143
gossypii*, Contarinia 210
Illinois, H. of 143
Life-cycle of _Pemphigus_ 484
Maine, H. of 484
Minnesota, H. of 131
New Jersey, H. of 443

Pemphigus 484
Pennsylvania, H. of 336
Poisonous H. 471
*populi**, *Schizoneura* 1
*rufomaculata**, *Aphis* 261
Saldoida 424
tessellata, *Pemphigus* 484
testudinatus, *Chaitophorus* ... 131
Van Duzee's "North American Membracidae" 291
West Indies, H. of........210, 211
Winged Aphids, Production of 122, 484

HYMENOPTERA.

*alpestris**, *Tachysphex foxii* 223
Andrena 42
Angolan H. 33, 226, 227, 228, 230
Ant with Aphids 144
Ants and *Saldoida* 427
Ants associated with pupae 497
americanus, *Perilitus* 202
Aphelinus 365
Apis 227
Army ants 226
Bembicidae 373
*besseyae**, *Crabro* 410
Bombus 80
Bombus caught by Asilid 440
*brachycarpae**, *Crabro* 252
capitalis, *Scolioneura* 212
Carpenter mudwasp 231
*cockerelli**, *Crabro* 255
Colorado, H. of, 78, 220, 245, 367, 373, 418, 419
Crabro [illegible] 245, 258, 418, 419
crassus, *Tachytes* 224
Crematogaster 144
Delaware, H. of 212
*deltaensis**, *Microbembex monodonta* ... 375
*depressiventris**, *Nomada* 323
[illegible]*, *M*[illegible] 4[illegible]
Dorylus 226
[illegible]* *Crabro* 255
*eriogoni**, *Crabro* .... [illegible]
*ferrugineipes**, *Crabro* ... 250
*fossor**, *Oxybelus* 179
*foxii**, *Tachysphex* ... 223
*gillettei**, *Crabro* .... 41[illegible]
Headlee and Dean's "Mound Building Prairie Ant", 365, 43[illegible]
Helorimorpha .... [illegible]
*heraclei**, *Crabro* 253
*hitei**, *Tachysphex* ...... 22[illegible]
Indiana, H. of .... [illegible]
*larimerensis**, *Belomicrus* 41[illegible]
Light, *Vespa crabro*, attracted to .... [illegible]
lineolata, *Crematogaster* [illegible]
Massachusetts, H. of . . [illegible]
*megacephalus**, *Crabro* [illegible]
*melanderi**, *Helorimorpha* [illegible]
*meliloti**, *Bembidula* [illegible]
Mellinus .... [illegible]
Mexico, H. of ... [illegible]
militaris, *Polyrachis* [illegible]
*modestum**, *Rhopalum* [illegible]
Nebraska, H. of [illegible]
*neomexicana**, *Microbembex monodonta* [illegible]
New Jersey, H. of [illegible]
New Mexico, H. of, 17[illegible], [illegible] 377, 379
*nigrescens**, *Tachysphex* [illegible]
[illegible], *Apis* [illegible]
*nigritus**, *Aphelinus* [illegible]
*nokomis**, *Crabro* [illegible]
Nomada . [illegible]
*occidentalis**, *Microbembex monodonta* [illegible]
[illegible]*, *Crabro* [illegible]
[illegible]*, *Crabro* [illegible]
Oxybelus [illegible]
Parasitic H., [illegible] 391, 430
Pennsylvania, H. of [illegible]
Pheidole [illegible]
Pol[illegible] [illegible]

Preoccupied names in *Andrena* 42
*primaestate**, *Bembex* 378
pruinosa, Tapinoma 154
quadridens, Monobia 231
Rhopalum 258
Salius 228
Schmiedeknecht's "Die Hymenopteren Mitteleuropas". 182
*secunda**, *Ichneutidea* 419
*semiflavus**, *Aphelinus* 367
*skinneri**, *Nomada* 323
Sleeping habit of a bee 340
South Carolina, H. of 367
Tachysphex 220
Tahiti, Bees of 466
Tapinoma 154
Termite-feeding ant 33
Texas, H. of 202, 375
*townsendi**, *Oxybelus* 180
Virginia, H. of 323, 436
Winter, Male *Polistes* survive 107
*wolcotti**, *Mellinus* 299

LEPIDOPTERA.

Aberrations of L., 89, 191, 239, 393, 498.
Aborted tails of *Laertias philenor* 85
*agrifoliella**, *Lithocolletis* ... 105
ajax, Papilio 191
Alberta, L. of 108, 124
Altitude and distribution of L. 347
amicta, Natada 29
Angola, L. of 29
antiacis, Lycaena 476, 478
appassionata, Papaipema 150
*arcuella**, *Lithocolletis* 107
Argynnis 108, 124
Arizona, L. of ...69, 77, 188, 263
astarte, Argynnis 108
asterias, Papilio 237
ausonides, Euchloe 204
Basilarchia 347, 348
bassiformis, Sesia 164
behrii, Lycaena 477, 482
British Columbia, L. of, 103, 124, 340.
Burns, collection of L. 404
Butterfly fakers 259
California, L. of, 13, 14, 43, 105, 149, 314, 317, 340, 476, 483.
cara, Catocala 116
*carolina**, *Callosamia angulifera* var. 231
castoria, Pontia 314
catalpae, Ceratomia 197
catalpae, Daremma 494
Catocala 47, 54, 115, 237
*catskillata**, *Eupithecia* 192
Cocoons, Bunched 343
" Compound 89
" Hanging 41
Codling moth 11
Color of cocoons, due to environment 87
Colorado, L of ..43, 135, 263, 264
Columbia, L. of District of .. 79
*confórmata**, *Eupithecia* ..128, 195
Connecticut, L. of 47
cresphontes, Papilio 219
*cyanosparsella**, *Eriocrania* .. 14
cynthia, Philosamia 391
daeckeana, Olethreutes 151
dejecta, Catocala 47
Diseases of L. 189, 439
Erebia 73, 341
Erebus, 83, 190, 260, 342, 444, 495
*erpata**, *Eupithecia* 193
Eupithecia 128, 192, 196, 312
Fernald's "Genera of Tortricidae" 339
*filmata**, *Eupithecia* 129, 195
fiscellaria, Therina 189
Florida, L. of 348, 388
gratulata, Mesoleuca 189
*hirsuta**, *Papilio philenor* 149
Homoptera 13, 141

Hybrids of *Smerinthus* 88
Illinois, L. of 3, 346
*indiana**, *Helioloncha* 423
Indiana, L. of............421-423
ines, *Thecla* 69
Inflation of larvae 9
*invictella**, *Recurvaria* 316
Iowa, L. of 369, 493
Java, L. of 293
*kearfottella**, *Lithocolletis* ... 100
Lithocolletis 99
luteata, *Eupithecia* 196
Lycaena 476
Maine, L. of 152, 260, 321, 386
*malimalifoliella**, *Lithocolletis* 101.
*manitoba**, *Catocala* 54
Manitoba, L. of 55
Maryland, L. of 190, 402
Massachusetts, L. of 194, 260
*meritata**, *Eupithecia* 195
mexicana, *Terias* 43, 135, 437
Mexico, L. of 407
Migrating butterflies ....218, 388, 437.
miserulata, *Eupithecia* 312
Missouri, L. of 80, 115, 237, 238, 437, 408.
monuste, *Pieris* 388
*morenella**, *Gelechia* 317
multiscripta, *Cerura* 80
myrina, *Brenthis* 230
New Jersey, L. of 42, 84, 80, 100, 101, 102, 104, 180, 188, 230, 280, 344, 390, 391, 392, 409-417, 443, 494.
New York, L. of 129, 130, 142, 193, 194, 195, 238, 230, 317, 412, 415, 417
Nonagria 295
normani, *Caenurgia* 321
*nymphaealis**, *Blepharomastix* 263
oblonga, *Nonagria* 295
obsoleta, *Limenitis* . [illegible]
*occidentalis**, *Blepharomastix* . 263
*ochralis**, *Symphysa* 263
odora, *Erebus* ....83, 190, [illegible]
odoratus, *Erebus* ... [illegible], 444, [illegible]
Ohio, L. of......... .... 106, [illegible]
*oslarellus**, *Crambus* [illegible]
palpata, *Eupithecia* ..... [illegible]
pamina, *Hyperchiria* .... [illegible]
Pamphila, Early stages of . [illegible]
Papilio ....191, 219, 237, 391, [illegible]
parallela, *Archips*...... . [illegible]
Pennsylvania, L. of 142, 104, [illegible], 194, 195, 230, 295, 316, 328, [illegible], 343, 409-417, 444, 495, [illegible], [illegible]
pheres, *Lycaena* .... . [illegible]
philodice, *Colias* .... [illegible]
*plagalis**, *Pyrausta* [illegible] 263.
*platanoidiella**, *Lithocolletis* [illegible]
plexippus, *Anosia* . .. 218, [illegible]
polyphemus, *Telea* ....13, 141, [illegible]
Pupae associated with ants [illegible]
pyralidiformis, *Sesia* .. [illegible]
rubra, *Samia* .... [illegible]
*saccharella**, *Lithocolletis* [illegible]
*salicivorella**, *Lith*[illegible]
Saturniidae, Causes [illegible] of ...... [illegible]
*schuylkillensis**, *P*[illegible]
Sesia .. . [illegible]
sexta, *Phlegethontius* [illegible]
*skinneri**, *Anisota* [illegible]
South Carolina, L. of [illegible]
Strecker collection [illegible]
Texas, L. of [illegible]
titan, *Sesia* [illegible]
tityrus, *Eudamus* [illegible]
*tremulaefoliella**, *Lith*[illegible]
*trinotella**, *Lith*[illegible]
troilus, *Papilio* [illegible]
unijuga, *Catocala* [illegible]
Variation in L., 84, 186, [illegible] 230, 301, 303
Virginia, L. of [illegible]
Wisconsin, L. of [illegible]
xerxes, *Lycaena* [illegible]

NEUROPTERA.

Aeshna 264, 301
Aeshninae, Key to wings of.. 456
americana, Halter 34
Arizona, Odonata of 45, 235
California, N. of 204
Chauliodes 133
clara, Oliarces* 203
Collecting Odonata, Device for 390
Colorado, N. of 455
Cordulinae, Revision of...... 428
Fossil Dragonfly 455
Indiana, Odonata of, 302, 305, 306
jalapensis, Aeshna* 264, 307
Massachusetts, Odonata of.. 302
Mexico, Odonata of......307, 440
Missouri, N. of.............. 437
multicolor, Aeshna 264, 301
mutata, Aeshna 264, 301
Neuronia 134
New Jersey, N. of, 440, 441, 443, 444.
North Carolina, N. of, 50, 133, 134, 443.
Oklahoma, Odonata of....... 433
*Oliarces** 203
Panorpidae of North Carolina 50
Pennsylvania, N. of, 335, 337, 444
*Platycordulia** 431
Scorpion-flies 50
solida, Aeshna 458
Virginia, Odonata of........ 384
Winds and Odonate Distribution 442
xanthosoma, Platycordulia* .. 432

ORTHOPTERA.

Acrididae, Morse on American 35
Alberta, O. of.............. 444
Anabrus 44
Angola, O. of.........29, 30, 32
Arizona, O. of............. 463
California, O. of........... 158
carolinensis, Camptonotus 488
chlorium, Cyrtophyllicus* 158
Colorado, O. of............. 126
Convergence in Acrididae.... 441
Crickets as food............ 29
*Cyrtophyllicus** 156
Florida, O. of............... 441
Fossil O. 126
Leaf-roller, Orthopterous 488
maculata, Palaeorehnia* 126
Maryland, O. of............. 488
membranaceus, Brachytrypus. 29
Migratory locust 30
muticus, Anurogryllus 461
New Jersey, O. of........... 444
North Carolina, O. of........ 16
Novel means to destroy grasshoppers 439
*Palaeorehnia** 126
Peculiar food of grasshopper. 498
Pennsylvania, O. of......... 327
peregrinatoria, Schistocerca .. 30
wellmani, Dacnodes 32

AUTHORS.

Banks, N. 203, 340, 384
Bessey, E. A. 388
Beutenmüller, W. 54
Biederman, C. R. 77
Blaisdell, F. E. 499, 500
Bowditch, F. C. 216
Bradley, J. C. 94
Braun, A. F. 99
Brimley, C. S. ...16, 107, 134, 168
Brues, C. T. 182, 363
Busck, A. 316
Calvert, P. P. 45, 83, 233, 235, 308 and Index.
Casey, T. L. 41
Caudell, A. N. 45, 463
Cockerell, T. D. A., 126, 179, 211, 234, 323, 455, 466.
Cockle, J. W. 341
Cooley, R. A. 139
Coolidge, K. R., 13, 66, 73, 135, 204, 314, 342.

Cresson, E. T., Jr. 95
Davis, J. J. 143, 383
Davis, W. T. 42
Doane, R. W., 5, 173, 200, 405, 438
Dod, F. H. W. 108, 124
Dow, R. P. 239, 348, 440
Dury, C. 368, 386, 389
Easton, N. S. 114
Ely, C. R. 47, 79
Engel, H. 164
Englehardt, G. P. 85, 142, 185
Ewing, H. E. 243, 449
Fall, H. C. 159
Felt, E. P. 210
Fenyes, A. 56
Fernald, C. H. 260
Fox, C. 434, 452
Freedley, W. G., Jr. 289, 293
Gillette, C. P. 1
Girault, A. A., 4, 76, 132, 197, 202, 236, 383.
Greene, G. M. 241
Grossbeck, J. A., 87, 88, 89, 189, 190, 315, 392, 393, 473.
Haimbach, F., 40, 186, 187, 188, 203, 343, 344, 390, 443, 466.
Hancock, J. L. 306
Headlee, T. J. 435
Hebard, M. 159
Holmes, F. M. 403
Hooker, C. W. 340
Horn, W. 235
Houghton, C. O. 120, 212, 300
Howard, L. O. .... 3[illegible]
Hungate, J. W. 234
Jones, F. M. 150, 231
Knetzer, A., [illegible], 89, 237, 238, 337, 317, 437, 468
Kunze, R. E. .... [illegible]
Kwiat, A. .... 1[illegible]
Laurent, P. 108
Mann, W. M. ....280, 45[illegible]
Marlatt, C. L. .... [illegible]
McAtee, W. L. 488
McClung, C. E. 440
Melander, A. L. 11
Merrick, F. A. .... [illegible]
Mitzmain, M. B. ....353, 380, [illegible]
Morris, E. L. .... [illegible]
Newcomer, E. J .....[illegible], [illegible]
Patch, E. M. ....32[illegible], [illegible]
Paxson, O. S. .... [illegible]
Pearsall, R. F. ....128, [illegible], [illegible]
Pergande, T .... [illegible]
Plitt, E. A. .... [illegible]
Porter, A. F. .... [illegible]
Rehn, J. A. G. ......[illegible], [illegible]
Riley, W. A. .... [illegible]
Rohwer, S. A., 43, 78, 17[illegible], 2[illegible], 245, 373, 417.
Rowley, R. R .... [illegible]
Russell, H. M .... [illegible]
Russell, J. .... [illegible]
Saverner, P. A .... [illegible]
Schaeffer, C. .... [illegible]
Sherman, F., Jr. ...[illegible], [illegible]
Skinner, H., 34, 44, 78, 180, [illegible], 181, 290, 318, 384, 385, [illegible], [illegible], 440, 444, 445, [illegible], [illegible]
Slosson, A. T .... [illegible]
Smith, H. S .... [illegible]
Smith, J. B ....[illegible], [illegible]
Smyth, E. A., Jr. .... [illegible]
Snyder, A. J .... [illegible]
Snyder, H. A .... [illegible]
Swett, L. W .... [illegible]
Tandy, M .... [illegible]
Tucker, E. S .... [illegible]
Viereck, H. L. .....[illegible], [illegible]
Walton, W. R., [illegible], [illegible], [illegible], [illegible], [illegible]
Wasmann, E. .... [illegible]
Webb, J. G .... [illegible]
Wellman, F. C. .....[illegible], [illegible]
Williams, F. X .....[illegible], [illegible]
Williamson, E. B ...[illegible], [illegible], [illegible]
Wilson, H. F .... [illegible]
Wolcott, A. B .... [illegible]
Wood, W. C .... [illegible]
Woodworth, C. W .... [illegible]
Wright, J. D. E. .... [illegible]
Wright, W. S. .... [illegible]

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

I have for exchange cocoons and pupae of *P. podilarius*, *machaon*; *Sphinx ligustri*, *pinastri*, *euphorbiae*, *elpenor*, *porcellus*, *tiliae*, *occelata*, *populi*, *stellatarum*; *Saturnia pyri*, *pavonia*; *Aglia tau*; *End. versicolora*, *G. lanestris*, *Ph. bucephala*, *C. vinula*, *N Ziczac*, and eggs of *Catacola fraxini*, *nupta*, *promissa*, *elocata* and *electa*.—Joseph Sever, 335 E. 49th St., New York City.

Wanted for Cash or exchange living pupae *Papilio turnus*, *troilus*, *philenor* at 5c. each; *excaecatus*, *geminatus*, *myops* at 5c. each; *modesta* 10c. each; *lineata* at 5c., *jorulla* at 7c., *Dat. nimistra* at 5c.—A. F. Porter, Decorah, Iowa.

Correspondence solicited with collectors who have been victimized by foreign dealers or collectors. Correspondence confidential. Object retribution.—Address A. F. Porter, Decorah, Ia.

I have larvae of *Catocala illecta* feeding on honey-locust, and shall have chrysalids in a few weeks. From eggs of *C. piatrix* and *C. vidua* shall soon have larvae. Larvae of other later. Want *C. parta* and *C. amatrix*.—R. R. Rowley, Louisiana, Mo.

Lepidoptera Wanted.—Catocala, Papilio, Arctians and other showy specimens of larvæ. Will send equally good things in return.—G. Eberhard, Berlin, Friedenau, Beckerstrasse t. Germany.

I offer bred Gortynas, fine butterflies, chrysalids of butterflies, hawkmoths, etc., and *Catocala* and other eggs. I want *Catocala* eggs, chrysalids of *ajax*, *turnus*, *asterias*, *troilus*, *cresphontes*, etc., or of any butterfly or hawkmoth or offers welcomed.—J. W. H. Harrison, 181 Abingdon Rd., Middlesbro', England.

I want to buy cocoons of *A. luna*, *A. angulifera* and *gloveri*. Pupae of *P. achemon* and *D. lineata*. Please state prices.—Sydney L. Wright, Jr., Logan, Philadelphia.

Fresh mounted examples of Macro- and Micro-lepidoptera from this locality offered in exchange for Macro-lepidoptera of North America new to my collection.—Fred. Marloff, Oak Station P. O., Alleg. Co., Pa.

Geometridae.—Will exchange or pay cash. Wanted especially in series *Eupthecias* from Maine and the Provinces, Canada and the Northwest, also western, southwestern and southern forms.—Address R. F. Pearsall, 1334 Dean St., Brooklyn, N. Y.

Liberal exchange in European and Missouri Lepidoptera for exotics and natives not in my collection.—Aug. Knetzger, 3822 McDonald St, St. Louis, Mo.

Fertile eggs of *Catocala ilia*, *neogama*, *piatrix*, *robinsoni*, *vidua*, *retecta*, *innubens*, *cara* and *amatrix*. For sale or exchange.—George M. Dodge, Louisiana, Mo.

Specimens of Lepidoptera for exchange from this locality.—Fred. Burns, 636 Center St., Reno, Nevada.

Lepidoptera from the State of Missouri. Papered specimens in good condition. Write for list.—F. Malkmus, 4398½ G Gilson Avenue, St. Louis, Mo.

Wanted for cash or exchange Meloidae, especially of genus *Meloe*, from North America north of Mexico.—R. W. Dawson, Dept. Ent., Univ. of Neb., Lincoln, Nebraska.

Cordalis cornuta larvae.—I desire to purchase in quantity "dobsons" in alcohol or formaline, or preferably in chloral hydrate (see Comstock and Kellogg, Insect Anatomy, p. 29). Please state price desired. J. F. Abbott, Washington University, St. Louis, Mo.

Would like to exchange Coleoptera for Hymenoptera.—J. J. Baumberger, 22 Lyn St., San Francisco, Cal.

Wanted—Two male and two female *Argynnis diana* with data. Fresh perfect specimens only. Will pay cash.—William Place, Jr., 13 [illegible] Ave., Providence, R. I.

Bred specimens of *Anaea andria* in papers and of *Catocala* [illegible] on pins. Other Catocalae, *Papilio cresphontes* and pupae of Papilio, Sphinges and Bombycids for exchange. R. R. Rowley, Louisiana, Mo.

For exchange—*Panorpa rufa, lugubris, americana.* Fulgoridae—*Priocera fuliginosa.* Hymenoptera—*Megacilissa electa.* Scarabaeidae—*Bradycinetus ferrugineus.*—A. H. Manee, Southern Pines, N. C.

Complete lists of North American insects of all orders for exchange furnished on application.—Charles H. Withington, Kansas University, Lawrence, Kansas.

For exchange—Mexican moths, principally Sphingidae, wish the larger western butterflies in exchange.—W. R. Walton, 810 N. 18th St., Harrisburg, Pa.

INSECTS OF NORTH CAROLINA

I am desirous of securing accurate data concerning occurrence of all species of insects in this State. Correspondence desired with parties or institutions having North Carolina material. Willing to pay for accurately prepared lists of any considerable number of species. Correspondence wanted with parties desiring material in certain groups from this State. Will gladly give suggestions to persons desiring to find suitable collecting grounds in this State [illegible] work at any season. In short, want the varied and interesting [illegible] of this State to be known and recognized by entomologists, and will [illegible] in every way to make it known and get it recorded. About [illegible] line and numerous mountain ranges and peaks 5000 to 6700 feet [illegible] touches of subtropical and boreal faunas and all intergradations. [illegible] mention this advertisement.

FRANKLIN SHERMAN, JR., Entomologist

State Department of Agriculture, Raleigh, North Carolina

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,

6, Gunterstone Road, West Kensington, London, W.

Cat. No. 17 for 1908 now ready, mailed free on demand.

The only dealers' list giving authors' names throughout. [illegible] mens [illegible] ex Assam, 40 different species in papers [illegible] *tes*, gratis, [illegible], mailed free on receipt of Post Office Order $1 [illegible] Catalogue with over 3000 descriptions and many interesting [illegible]

PARCELS SENT ON APPROVAL FOR SELECTION.

FOR SALE. COMPLETE SET OF EDWARDS' BUTTERFLIES

Mrs. S. E. DE LA MATER, Glen Head, Long Island, N. Y.

The Butterflies of the West Coast

A new book. Text, descriptive and critical, of all known species, illustrated with thirty-two full page plates in best modern photographic color work, with nearly a thousand figures, in 480 species.

FOR LIBRARIES, STUDENTS, EXPERTS.

On account of the great fire in San Francisco the book is already practically out of print; is not in any dealers' stock, and only a few copies now remain in the author's hands.

Royal octavo, 8 x 10 in., best buckram binding. Price, $10 postpaid.

COLORED PLATES of the BUTTERFLIES of the WEST COAST

An abridgement of the above, consisting of the full set of plates as issued in that book, with names of all species printed on pages facing the plates, but with no descriptive text; issued as the best possible substitute for that more expensive book which will soon be unobtainable.

Size, 8 x 10 in., bound in best silk cloth. Price, $1.50 post. For either book address the author.

W. G. WRIGHT, 445 F STREET, SAN BERNARDINO, CALIFORNIA

African, South American or Indian butterflies in papers. 100 (40 to 60 different), $2.50; second quality, $1.25. 50 different tropical Papilios, several new from New Guinea, South Sea Islands, etc., named and set, $10.00. All postage free. British and Tropical Lepidoptera, Coleoptera, etc. Lists of check lots post free.—A. FORD, Entomologist, 36 Irving Road, Bournemouth, England.

COLEOPTERA OF NORTH AMERICA

BOUGHT AND SOLD

Pelophila ulkei and other Labrador species.

General collections at low rates

JOHN D. SHERMAN, JR., 335 A Decatur Street, Brooklyn, N. Y.

FOR SALE.—Lepidoptera and Coleoptera of San Diego Co., Cal.: Tharsalea hermes, Lemonias augusta, Argynnis semiramis, Nathalis iole, Prenes errans, Hemileuca electra and many other nice things.

L. E. RICKSECKER, 3637 Vermont St., San Diego.

FOR SALE Moths from the high altitudes of Mexico. Lowest market prices. Price list furnished on application.

W. R. WALTON, 810 N. 18th Street, Harrisburg, Penna

The Celebrated Original Dust and Pest-Proof

METAL CASES

FOR SCHMITT BOXES

Described in "ENTOMOLOGICAL NEWS," page 177, Vol. XV

MANUFACTURED AND FOR SALE BY

BROCK BROS., Harvard Square, Cambridge, Mass.

FOR SALE

About 1,000 pinned North American, Mexican and Exotic Lepidoptera. Mostly named and in prime condition. The ENTIRE LOT for cash. No single specimens or exchanges. Many rare specimens, Papilio and Sphinx. Write for price.

Dr. M. E. HOAG, Wapello, Iowa.

ATTACUS ORIZABA COCOONS

Just arrived from Mexico, dozen, $1.80; hundred, $12.50

The following cocoons to arrive in a few days:

Hyperchiria incarnata . .	$2.25 a dozen;	20 cents each
Hyperchiria budleyi . .	2.25 "	20 "
Copaxa lavendera . . .	5.50 "	50 "

Other Species Later

O. FULDA, 816 Broadway, New York

When calling at my New York Store, mention News to get special prices

---

NATURHISTORISCHES INSTITUT "KOSMOS."

HERMAN ROLLE, BERLIN, W. 30, SPEYERER STR. 8.

Offers Catalogues as follows:
Supplement to the Catalogue of Exotic Coleoptera, &c.
Catalogue of Exotic Lepidoptera, &c. Catalogue of Exotic Coleoptera, etc.
Catalogue of Palaearctic Lepidoptera, etc.

All Catalogues are carefully arranged in systematical order following to the best Catalogues with indications of authors, families, subfamilies, localities, synonymes, etc.

Best help for the arrangement of the collections.

JOURNAL OF ECONOMIC ENTOMOLOGY

Official Organ of the Association of Economic Entomologists

Editor, E. Porter Felt, Albany, N. Y.; State Entomologist, New York
Associate Editor, A. F. Burgess, Wash., D. C.; Sec. Assn. Econ. Ent.
Business Manager, E. Dwight Sanderson, Durham, New Hampshire
Advertising Manager, Wilmon Newell, Baton Rouge, Louisiana

Advisory Board { L. O. Howard, S. A. Forbes, James Fletcher, H. A. Morgan, Herbert Osborn, H. T. Fernald

A bi-monthly journal devoted to the interests of Economic Entomology, publishing the official notices and proceedings of the Association of Economic Entomologists. The best work in Economic Entomology will appear in its pages.

Terms of Subscription :—In the United States, Cuba and Mexico, two dollars annually in advance ; to Canada and foreign countries, two dollars and thirty cents annually in advance. Address

JOURNAL OF ECONOMIC ENTOMOLOGY, Durham, New Hampshire

BUTTERFLIES AND MOTHS

FOR SALE, CHEAP—A collection consisting of nearly 3000 named specimens representing an excellent lot of interesting exotics, as well as a good series of North American species, both diurnals and nocturnals.

Fred. M. Mueller, 167 Evanston Ave., Chicago, Ill.

1,000 PIN-LABELS, TWENTY CENTS!

Printed from the smallest type made. About 30 on a strip. No trimming—One cut makes a label. Send Money Orders Orders must be in multiples of 500, and no order will be filled for less than 500 each of 2 labels or 1,000 of one

C. V. BLACKBURN, 32 Chestnut St., STONEHAM, MASS.

N. B.—Labels are limited to 25 letters. Each addition letter 1c. per M.

I AM LOOKING for collectors who deal with insects, pupae, butterflies and larvae from Mexico, Texas, Arizona and California paying cash. Regarding further information, communicate with JOSEPH SEVER, 335 East 49th Street, New York.

NOVA SCOTIAN INSECTS

LEPIDOPTERA—in papers—pinned—full data given—named—in finest condition—many rare kinds

100 specimens of 70 species, $6,00 **200 specimens of 140 species, $11.00**

Prices include cost of transportation
Mounted Lepidoptera, Diptera, Coleoptera and other insects of other Orders at very low rates

JOHN RUSSELL, DIGBY, NOVA SCOTIA

When Writing Please Mention "Entomological News."

THE KNY-SCHEERER CO.

Department of Natural Science, G. LAGAI, Ph. D.

404 WEST 27TH STREET, NEW YORK.

ENTOMOLOGICAL SUPPLIES AND SPECIMENS.

The Asta Insect Cabinets.

K.-S. Section Cabinets.

Schmitt Insect Boxes.

K.-S. Lepidoptera Boxes, Coleoptera and Duplicate Boxes.

K.-S. Screw Handle and American Nets.

The Asta Insect Pins:

White, 50c. per 1000.

Black, 70c. per 1000.

Catalogue II, Entomological Supplies, on Application.

THE KNY-SCHEERER CO.

DEPARTMENT OF NATURAL SCIENCE.

G. LAGAI, Ph.D., 404 W. 27th Street, New York, N. Y.

PARIS EXPOSITION:
Eight Awards and Medals

PAN-AMERICAN EXPOSITION:
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

ENTOMOLOGICAL SUPPLIES AND SPECIMENS

North American and exotic insects of all orders in perfect condition.
Single specimens and collections illustrating mimicry, protective coloration, dimorphism, collections of representatives of the different orders of insects, etc.
Series of specimens illustrating insect life, color variations, etc.
Metamorphoses of insects.
We manufacture all kinds of insect boxes and cases (Schmitt insect boxes, Lepidoptera boxes, etc.), cabinets, nets, insects pins, forceps, etc.
Riker specimen mounts at reduced prices.
Catalogues and special circulars free on application.
Rare insects bought and sold.

When Writing Please Mention "Entomological News."

[illegible], Printer, [illegible] N. 7th Street, Philadelphia.

FALCONER BIOL. LIB.

DATE DUE

NON CIRCULATING
DO NOT REMOVE
FROM THE LIBRARY

STANFORD UNIVERSITY LIBRARIES
STANFORD, CALIFORNIA 94305-6004